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Eagle Series Computer Owner's Manual

To re-order this document, request part number DSO-00196-00.

FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian Department of Communications Compliance Statement

This equipment does not exceed Class A limits per radio noise emissions for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps are necessary to correct the interference.

Avis de Conformité aux Normes du Ministère des Communications du Canada

Cet équipement ne dépasse pas les limites de Classe A d'émission de bruits radioélectriques pour les appareils numériques tels que prescrites par le Règlement sur le brouillage radioélectrique établi par le ministère des Communications du Canada. L'exploitation faite en milieu résidentiel peut entraîner le brouillage des réceptions radio et télé, ce qui obligerait le propriétaire ou l'opérateur à prendre les dispositions nécessaires pour en éliminer les causes.

Battery Warning

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

ATTENTION: Il y a danger d'explosion s'il y a un remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

For AM-3500-E100, -E200, -E300, -E400, -E500 and AM-990-01 systems, replace battery with Panasonic or Ray-O-Vac BR2325 only. Use of another battery may present a risk of fire or explosion. Replacement batteries may be ordered from your authorized Alpha Micro reseller.

For AM-3500-E550, and AM-990-04 systems, replace batteries with Panasonic or Ray-O-Vac BR1225 only. Use of another battery may present a risk of fire or explosion. Replacement batteries may be ordered from your authorized Alpha Micro reseller.

Electrical Warning

This equipment contains components that can be damaged by static electricity. Follow all electronic discharge precautions when handling the equipment. For example, touch the metal back panel of the CPU or peripheral chassis to dissipate any electrical charge before touching the circuit boards or equipment within the chassis. After turning off power, before you open your computer chassis, unplug the cord from the electrical outlet to guard against electrical shock.

SOFTWARE SECURITY DEVICE IDENTIFICATION NUMBER: _____

The Alpha Micro Software Security Device (SSD) is a customized integrated circuit that personalizes the computer, providing identity verification for it. Certain Alpha Micro and non-Alpha Micro software may require that your computer contain an SSD in order to run software that has been customized to run only on your computer.

Please enter the identification of your SSD above. The SSD identification number should be on your computer I.D. label under "SSD Serial No." (Another way of finding the number is to look at the SSD itself. The SSD is located in an integrated circuit location on the CPU board; its identification number is printed on the SSD itself.) Software vendors may ask you for the SSD number if they are customizing software to run only on your computer.

This document may contain references to products covered under the following U.S. Patent Number(s): 4,530,048

ALPHA MICROSYSTEMS
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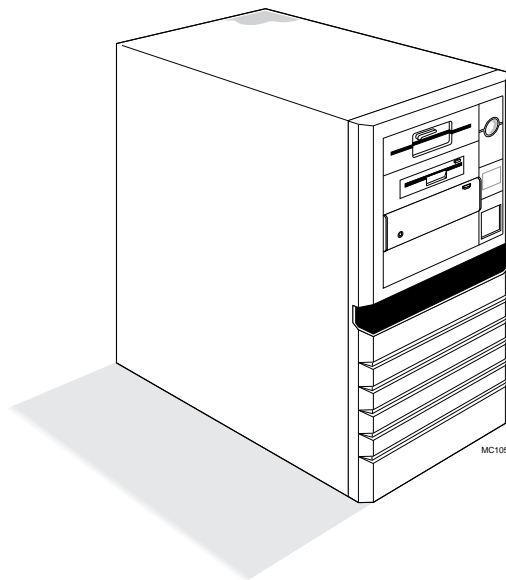
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CHAPTER 1

INTRODUCING THE EAGLE SERIES COMPUTER

Note: This manual describes the Eagle Series computer packaged in the Standard Eagle enclosure. For information on the optional high end AM-990 enclosure, see the *AM-990 SBC Service Manual*, part number DSS-10524-00.

Alpha Micro offers a complete line of computer systems ranging in capacity from one to over 300 users, and offering up to 64 megabytes of memory and thousands of megabytes of disk storage. The Eagle Series in its attractive desktide cabinet is the perfect introduction to the mid range of Alpha Micro's broad line of business computer systems.



The Eagle computer is packaged in a compact enclosure that sits neatly next to a desk. This computer offers the same kind of sophisticated, multi-user capabilities as the largest Alpha Micro computer. The Eagle Series standard software is compatible with that supplied with all Alpha Micro AMOS based computer systems. This gives you these advantages:

- If you decide at a later time to move on to one of the larger Alpha Micro computer systems, you can transfer your application programs and files to the new computer with little or no conversion or translation.

- The large number of applications packages and programming languages developed for the complete family of Alpha Micro computers are available for your computer, too!
- The Eagle Series consists of several different models; see the *Eagle Series Summary Specification Sheet* for more details on the different types of Eagle computers which are available.

Read on for more information on the tool that is going to make life easier for you!

ABOUT THIS BOOK

The purpose of this book is to get you started with your computer. After you have followed the instructions in this book, your computer will be set up and running. And, you will have a good idea of where to go next for information on the software you want to use.

This chapter contains a software and hardware overview of your computer. It also discusses the configurations available, as well as warranty and service information.

Chapter 2 tells you how to unpack and set up your computer. It also contains information on choosing an installation site.

Chapter 3 discusses turning on and resetting the computer, using the terminal keyboard, diskettes, streamer tape, DAT tape, and turning the computer off.

Chapter 4 is an overview of the various software available for your computer, and lists the Alpha Micro documentation you can order to learn more about each subject.

Chapter 5 discusses the use of some computer maintenance utility programs. It shows how to allocate system resources by entering the system initialization file commands to set up terminals and jobs for multi-user operation.

Chapter 6 contains information on the care and feeding of your computer.

Chapter 7 is a handbook of troubleshooting procedures you can follow to isolate a problem should something go wrong with your computer.












Chapter 8 lists the computer status codes you may see on the front panel display.

Several appendices contain technical information, including instructions for cable construction and installation.

The *Eagle Computer Service Manual* contains additional information on opening and configuring your computer. The service manual is intended for authorized technical personnel only.

Graphics Conventions

Like other documents in the Alpha Micro documentation library, this book contains a number of standard symbols to make our text easier to read and understand.

| SYMBOL | DESCRIPTION |
|---|---|
|  | This symbol means STOP! , and signals an important warning or restriction you must know about before continuing. |
|  | This symbol marks a hint, and identifies a shortcut or an easier way to do something. |
|  | This symbol says "Don't forget!" and signals information to remember. |
| AMOS Prompt: . | A dot on your terminal screen shows you're talking to the Alpha Micro Operating System, and AMOS is waiting for you to enter a command. AMOS allows you to define your own prompt symbol, so you may see a different prompt on your screen. |
| text | Text that looks like this in our examples shows the characters the computer displays on your terminal screen, such as prompts and information messages. |
| TEXT | Text that looks like this in our examples shows the characters you type on the computer keyboard. |
|  | This symbol tells you when to press the indicated key on your terminal keyboard. For example: DIR  tells you to press the RETURN key at the end of the DIR command. |
|  /  | This combination of symbols tells you to hold down the first key and press the second key. For example, to type a  /  (Control-C), press the  key and, while holding it down, press the  key. |

HARDWARE FEATURES

There are a number of physical components that go into the construction of your Eagle computer which provide the ability to process, input, display, and store data. The following sections highlight some of these components. For technical information on these devices, refer to the specification sheet supplied with your computer.

Processor

The heart of your computer is its powerful CPU (Central Processing Unit), a high speed 32-bit microprocessor. Eagle computers are available with either a MC68030 or MC68040 CPU, with CPU clock speeds ranging from 40 to 80MHz. One of the key features of the Eagle Series is expandability, which means that for most models, you can start with an MC68030 processor and upgrade later.

Hard Disk Drive

Your computer contains at least one SCSI-compatible 3 1/2" hard disk drive. Various capacities of hard disk drives are available. See your computer specification sheet for more information regarding hard disk drive capacity.

Diskette Drive

Your computer can contain one 5 1/4" (1.2MB) and/or one 3 1/2" (1.44MB) floppy diskette drive. A diskette drive offers the convenience of inexpensive, removable disk media that is easy to transport and store. See Chapter 6 for important information on taking care of and storing diskettes.

Streaming Tape or DAT Drive

Your computer may contain one SCSI compatible 1/4" streaming tape or DAT drive, allowing you to copy and restore files using special tape cartridges. Although your computer does not normally boot from these tape devices, if something does happen to your computer's hard disk, you can boot your computer from a special tape. A streaming tape cartridge can hold up to 2GB of data, and a DAT cassette can hold up to 4GB of data, depending on the model. See Chapter 3 for information on tape capacities.

Memory

Memory capacity is expandable and includes parity error detection. The amount of memory available on your computer varies from model to model. See the specification sheet included with your computer for more detailed information on memory capacity, and the *Eagle Computer Service Manual*® for instructions on installing it.

Front Panel Status Display

The status display on the front panel lets you know what is going on inside the computer even when no messages appear on your terminal. Some normal functions of the machine (e.g., clearing memory when the computer boots) cause codes to appear on the display, as do certain system errors.

In addition, the self test uses the status display to let you know how it is progressing, and if any errors have occurred. The self test checks the major hardware components in the computer for proper operation, including memory, disk controllers and drives, interval timer, and the serial I/O ports.

For information on all meaningful codes that can appear on the front panel display, see Chapter 8, "Status Display Codes." For information on using the self test, see the self test user's guide that accompanied this owner's manual.

Serial I/O Capability

Your computer can support as few as four or as many as 60 asynchronous serial I/O ports, depending on the model:

The **Eagle 100's** main electronics board, the AM-137, includes eight on-board RS-232 serial ports. All eight serial ports use standard DB-9 connectors. The on-board serial ports use a driver called AM318.IDV and use octal port numbers 0-7.

The **Eagle 300-500's** main I/O controller board can be configured to boot with either an AM-314 four-port serial I/O board, or an AM-318 eight-port serial I/O board. The AM-314 I/O board uses the AM314.IDV software driver and DB-9 connectors, while the AM-318 I/O board uses the AM318.IDV driver and an RJ-21 50-pin Telco connector.

The I/O *expansion*^oslot (or slots) on Eagle 100-500 systems can support both the four-port AM-314 I/O board and/or the eight-port AM-318 I/O board. The AM-314, which supports both RS-232 and RS-422 protocol, uses standard female DB-9 connectors; the AM-318, which supports RS-232 only, uses an RJ-21 50-pin Telco connector. Consult the installation instructions for the appropriate serial I/O board for details on installation and pinouts.

The **Eagle 550's** main I/O controller board includes four on-board RJ-45 connectors which provide standard RS-232 serial I/O communication. Since the four on-board serial ports provide the same operating characteristics as the AM-318 I/O board, they must also use the same AM318.IDV interface driver, and are assigned octal port numbers 0-3. The Eagle 550 also provides asynchronous serial I/O expansion via the standard Alpha Micro paddle card bus. The AM-359 eight-port serial I/O paddle card is the recommended choice for I/O expansion. Both the on-board RJ-45 serial ports, and the AM-359 expansion paddle card ports have identical pinout definitions.



AM-318 and AM-359 serial ports, as well as the Eagle 100's eight on-board serial ports and Eagle 550's four on-board serial ports can take advantage of a feature called Super I/O. Super I/O handles character output more efficiently than any other AMOS serial port driver, reducing the load on the CPU and making more CPU cycles available for other tasks. See Appendix C for more details.

Parallel I/O Capability

Eagle 100 computers have one standard-speed parallel port. Eagle 300-500 computers have two high-speed parallel ports, and Eagle 550 computers have four high-speed parallel ports. All Eagle parallel ports support the industry standard Centronics interface and use 25-pin shielded connectors. See Appendix A for the 25-pin parallel connector signal pinouts.



To insure the reliability and performance of your parallel ports, avoid using parallel printer cables longer than **six feet**.

External SCSI Port

Your computer includes an external SCSI (Small Computer Standard Interface) port to which you can attach additional SCSI compatible storage devices. Additional SCSI devices can include hard disk drives, a CD-ROM drive, or magnetic tape storage devices.

Add-on Equipment

The only thing you need to add is a terminal. It allows you to input and display the data processed and stored by the components discussed above. You will probably want to also add a printer to provide printed copies of your data. Your Value Added Reseller (VAR) may have provided these items as part of your computer purchase.

If you want to expand your computer in the future by adding additional storage and backup devices, see the *Eagle Computer Service Manual* for a diagram of where additional peripherals should be located in your cabinet.

Communications Options

Eagle 300-500 computers and Eagle 550 computers have two high performance Ethernet ports accessible from the computer's rear panel. One of the ports uses a shielded 15-pin A.U.I. connector; the other port uses an RJ-45 10Base-T connector. The 15-pin A.U.I. connector can be converted to thin Ethernet operation with the addition of a commercially available MAU transceiver. Ethernet is also available on Eagle 100 computers as an option, and requires the installation of Alpha Micro's AM-366 Ethernet board.

SOFTWARE FEATURES

Computer hardware is all potential and no action until the software programs instruct it to do something. Some of the features of the standard system software are listed below. Your VAR can provide software packages specifically suited to your needs, such as accounting software, programming languages, mathematical packages, and so on. These packages are not included in this list. See your VAR for information on service and support for such packages.

- The operating system, AMOS, performs many functions, one of which is to manage the computer's resources so multiple users can run on the computer at the same time. The operating system also includes all support software for the hardware devices mentioned above.
- Programs called "print spoolers" let you use one or more printers at the same time without tying up a user terminal.
- The Task Manager lets you schedule multiple background tasks to run without operator control at preset times and dates.
- A sophisticated command language allows you to invoke a stream of commands and program input (predefined by you) by entering a single command.
- The business-oriented AlphaBASIC programming language is uniquely suited to the programming of business applications software packages.
- A screen-oriented text editor provides an easy-to-use tool for creating documents.
- A text formatting program aids in document preparation.
- ISAM (Indexed Sequential Access Method), a machine language file management system callable from AlphaBASIC or assembly language programs, provides a method for quick information organization and retrieval.
- A simple system initialization procedure allows you to quickly change the types of peripheral devices connected to the computer, change user memory allocations, and customize the computer to your exact needs.
- AMOS provides support for many different kinds of printers and terminals, and gives you the ability to define your own type of terminal or printer to the computer.
- AlphaTCP allows your Alpha Micro computer to communicate with the increasingly popular TCP/IP protocol. This software allows you to connect to the Internet and receive Email and transfer files.

For an introduction to AMOS software, refer to Chapter 4, "Where Do I Go from Here?"

SERVICE INFORMATION

Alpha Micro provides a comprehensive post sales service and support program for its entire product line. Our VAR network is structured to provide you with immediate access to support assistance and information.

Our customer commitment is maintained through the expertise and skills of our competent, professional staff whose dedication assures all Alpha Micro customers the maximum benefits of quality support.

Alpha Micro warrants its products through their VAR network. Alpha Micro will repair or replace a defective product under warranty without cost to the purchaser. Should you wish to arrange for factory warranty service for your equipment, you should obtain a Return Authorization Number from Alpha Micro Technical Support. To arrange for on-site warranty service at your location, contact your Alpha Micro VAR or AMSO service organization.

In addition to the warranty service provided, support is available through Alpha Micro Field Operations. Our nationwide field service organization (AMSO) provides direct repair services to Alpha Micro computer owners. Alpha Micro Field Engineers are factory trained to ensure continuity of product servicing. Should you select hardware service from your servicing Alpha Micro VAR, you can be assured he or she is backed by, and in close touch with, Alpha Micro for full factory support.

For Further Assistance

If you are unable to contact your VAR, Alpha Micro will be glad to refer you to one. If you relocate and want to learn the name and address of an Alpha Micro dealer near you, please write or call Alpha Micro.

For information and the location of the Alpha Micro service location nearest you, call our toll free service number (800) 548-4848.

CHAPTER 2

INSTALLATION

This chapter gives general installation information for your computer. It discusses the following topics:

- Unpacking the computer
- Instructions for reshipping the computer
- Recording the SSD identification number
- Preparing the site for your computer
- Verifying AC power requirements
- Verifying the boot ID switch settings
- Eagle 550 Specific Features
- Eagle 550 CMOS Setup Procedure
- Turning on the computer
- Installing the operator terminal
- Initially testing the computer
- Booting under AMOS
- Installing Alpha Micro software
- Turning off the computer
- Accessing the computer
- Expanding your computer

Your Alpha Micro VAR can assist you with setting up, expanding, or servicing your computer.

UNPACKING GUIDELINES

Unpack the computer and **save all packing material and cartons** in case you ever need to transport the computer. The shipping material was carefully designed to provide optimum cushioning and protection. When re-shipping or otherwise transporting your computer, you must use the original packaging to ensure safe shipment.

When moving your computer, handle it gently. The hard disk in the main unit has moving parts and delicate read/write heads. Rough handling could damage the drive.

If the enclosure contains a 5¼" diskette drive, note that the drive may contain an insert used to protect the read/write heads. Do not remove this insert until you have installed the computer and are ready to start using it. The drive may be damaged if you move the computer and it does not contain the protective insert.

Unpack the terminal which will serve as the operator terminal and set it aside for now.

What You Will Need

When you unpack your computer you should find the following items:

- ___ This manual and warranty cards.
- ___ The main enclosure.
- ___ One AC power cord.

In addition to the equipment Alpha Micro has provided and the operator terminal, you may need the following:

1. Properly configured cables for connecting your terminal to the computer.

If you want to construct your own terminal cables, you need various tools and connectors as well as the actual cable material. See Appendix A for information on constructing terminal cables.

2. The manufacturer's operator manuals for your terminals and printers.

3. If your computer is set for 230 Volt AC operation, you need a 230 Volt AC power cord with the correct plug for your geographical area. Your local VAR may already have included this power cord with your computer; if not, contact your VAR for information on where to get it.

4. If the operating system has not already been installed on your hard disk, you will need a warm boot tape and a tape containing the operating system. This may be supplied by your VAR.

Reporting Shipping Damage

If there is any damage to the shipping container or the main enclosure, or if you are missing any items on the unpacking checklist, please call your VAR immediately.

Instructions for Reshipping the Computer

If shipping damage has occurred or the self test indicates a problem with the computer, your VAR may recommend that you ship it back.

If for some reason you cannot contact the VAR you bought your computer from, please call the Alpha Micro Sales Department; they will give you the name and address of an Alpha Micro VAR near you who can help you. See "Service Information" in Chapter 1.

When reshipping or otherwise transporting your computer, you must use the original packaging to ensure safe shipment.

Important Note: Please include a note to the person who will receive the computer containing the following information: your name, address, phone number, the date you shipped the computer back, and the reason for return.

Be as specific as possible about the problem you experienced—the more information you provide the easier it will be for the service technician to determine the reasons for any problems. If you performed any troubleshooting procedures, let the person receiving the computer know exactly what procedures you have done and what the results were.

RECORDING THE SSD IDENTIFICATION NUMBER

The Software Security Device (SSD) is a customized integrated circuit located on the main electronics board inside your Eagle computer. The SSD uniquely identifies your computer to customized software that has been configured to run only on your computer. If you purchase customized software from your VAR or other software vendors, you need to give them your SSD identification number (printed on the SSD chip itself) before they can "key" the software to your computer.

The SSD identification number is written on the system ID label on the back of the computer in the section titled "SSD Serial No." Please note the identification number of your SSD at this time and enter the number at the front of this book.

OVERVIEW OF INSTALLATION PROCEDURES

Now that you've unpacked your computer, and have everything you need to hook it up, you can begin to physically install it. Installing your computer is a matter of:

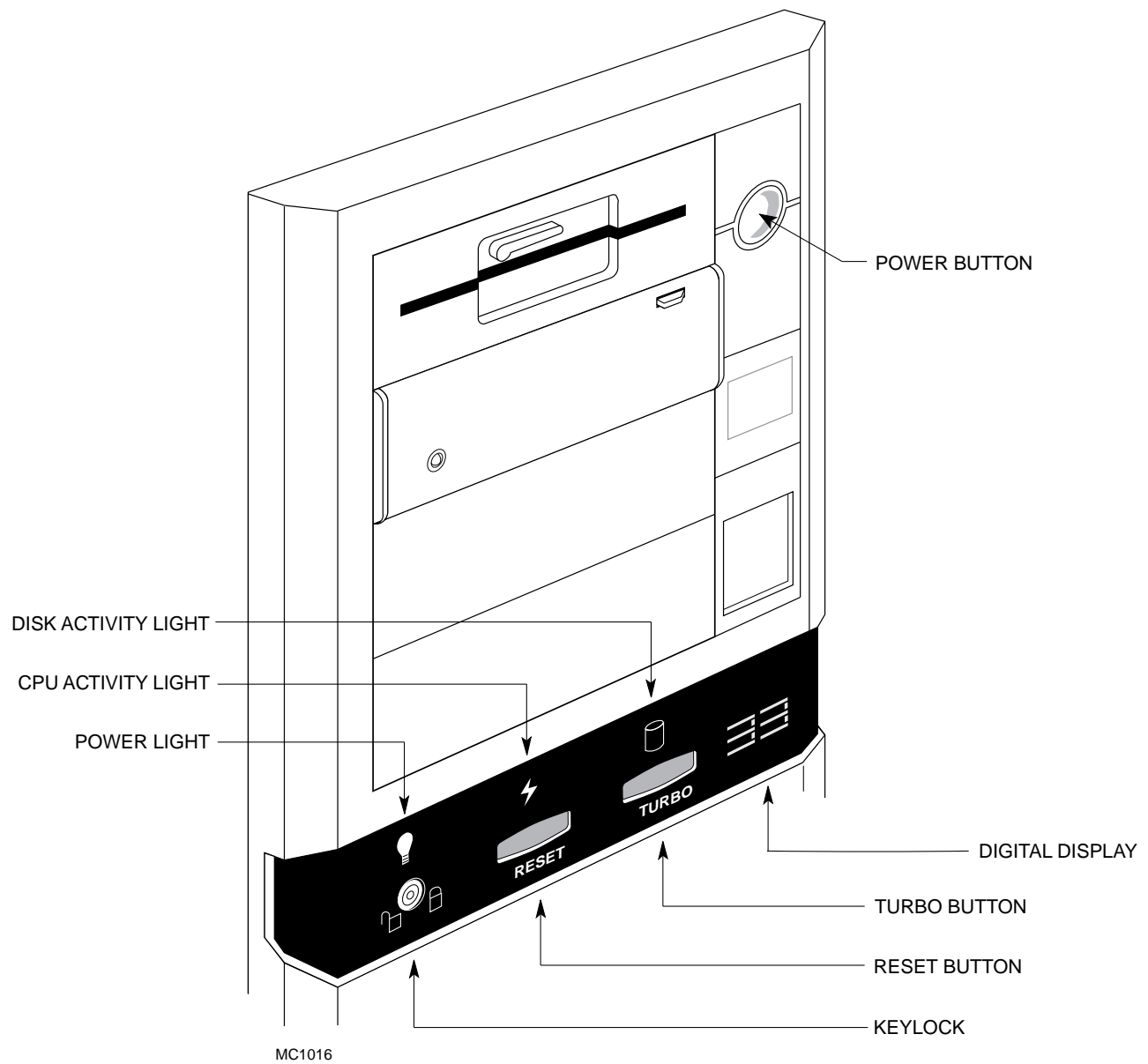
1. Choosing and preparing a location for it.

2. Making sure it is configured correctly for your local electrical requirements.
3. Verifying the boot ID switches or CMOS boot configuration, depending upon system type.
4. Running an initial diagnostic test to make sure the computer is working correctly.
5. Connecting terminals and printers.

Some of the sections in this chapter refer to various locations on the front and back panels of the computer. It might be a good idea to read the information in the next two sections dealing with front and rear panel connectors, controls, and indicators.

Front Panel Controls and Indicators

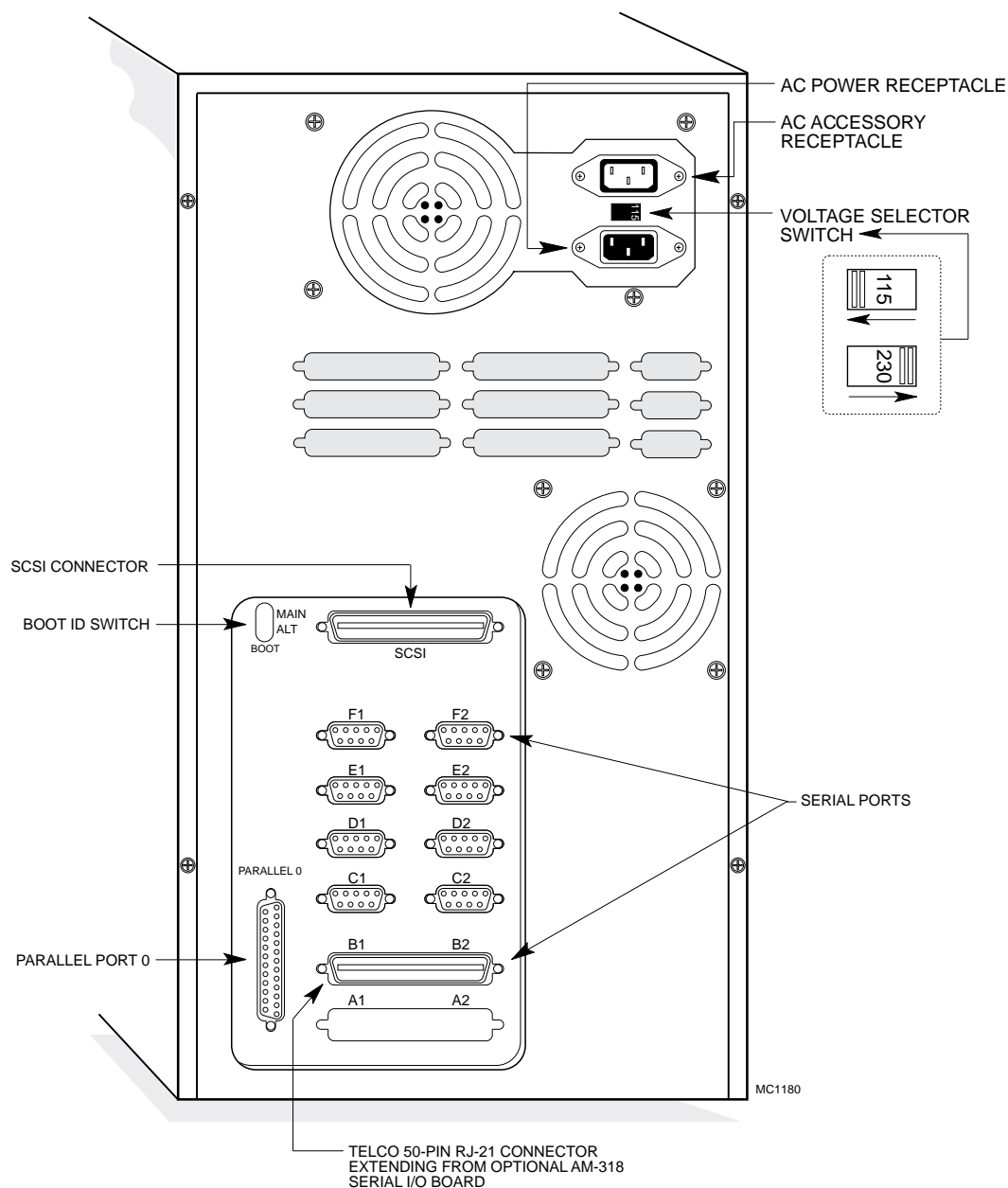
- The POWER, RESET, and TURBO buttons are shown on the following page.
- The Turbo button is not functional in AMOS-based Eagle configurations.
- The Power Indicator light is always lit when power is supplied to the computer.
- The CPU Activity light will remain lit whenever the CPU is active. During periods of inactivity, the light will be off.
- The control panel also contains a Keylock switch. When the switch is turned to the locked position, the Reset button on the computer's front panel is disabled. This feature will prevent someone from inadvertently pressing the Reset button while the computer is active. When the switch is turned to the unlocked position, the Reset button is enabled and will function normally.
- The Disk Indicator light is lit whenever there is hard disk activity.
- The Reset button allows you to reset the computer from the control panel. Once the Reset button is pressed, the hardware will be reset and the computer will reboot. To avoid losing any data, make sure there are no applications running before you press the Reset button.
- For information on various display codes that might appear on the Eagle's front panel digital display, see Chapter 8, "Status Display Codes."



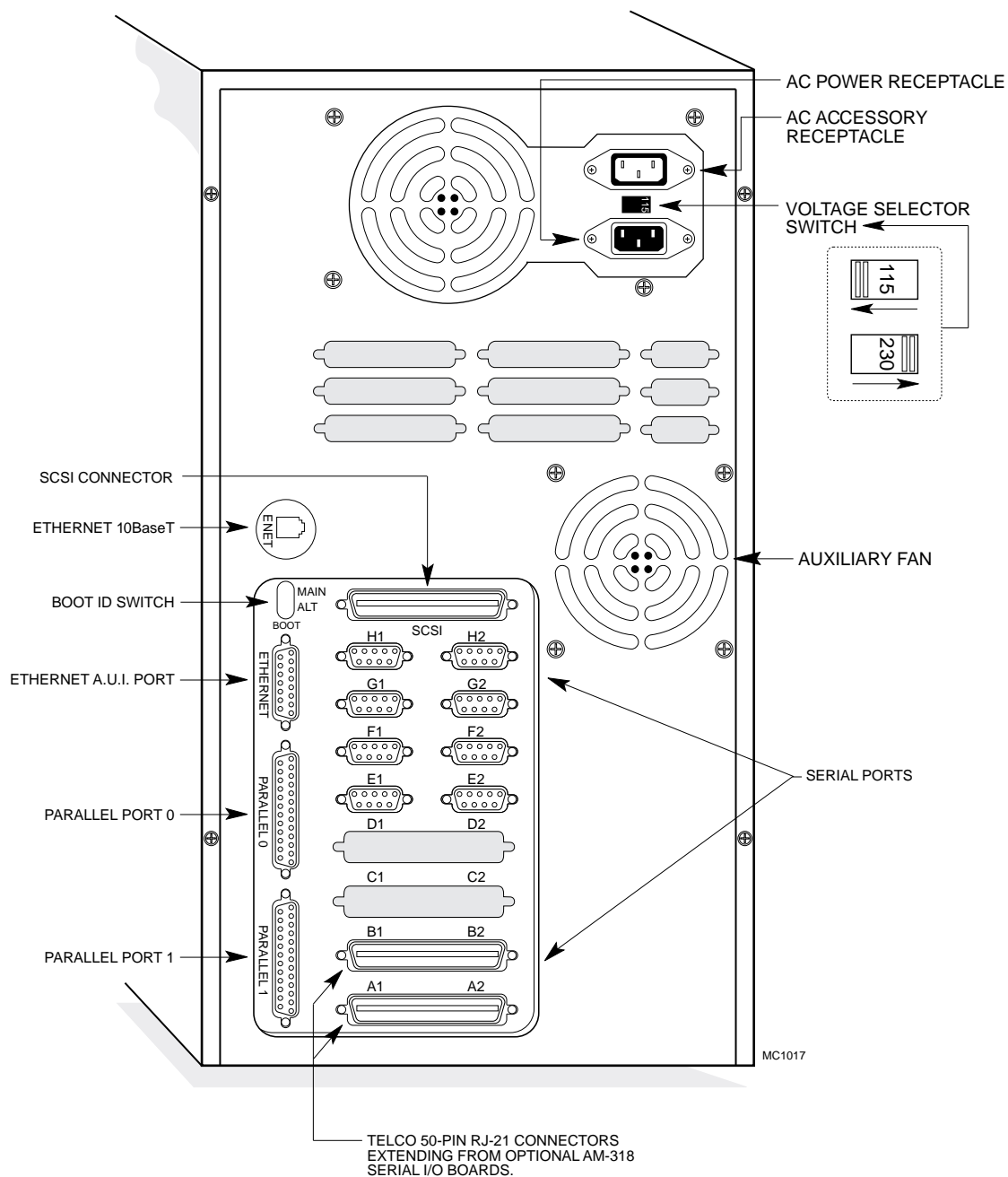
Front Panel Controls and Indicators

Eagle Rear Panel Configurations

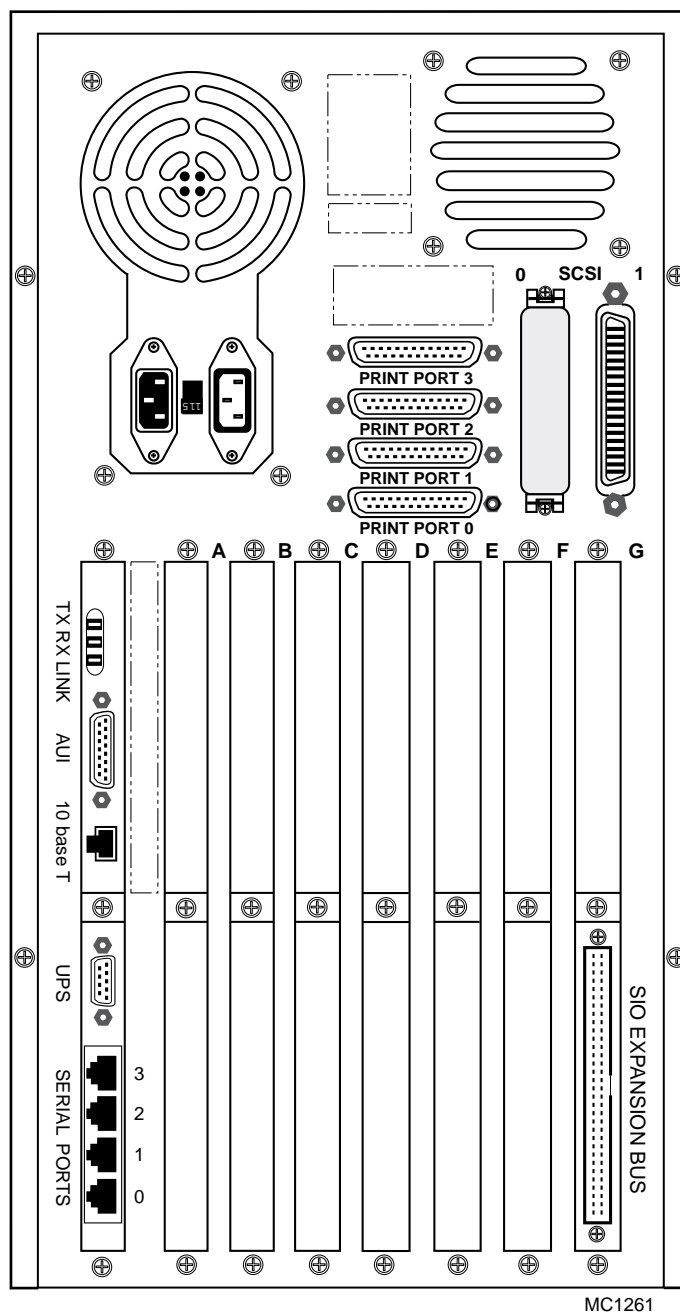
The types and number of connectors on the rear panel of your Eagle computer will vary depending on the model and the equipment included with your order. The illustrations on the next few pages show the Eagle 100, 300-500 and Eagle 550 rear panel configurations:



Eagle 100 Rear Panel Configuration



Eagle 300-500 Rear Panel Configuration

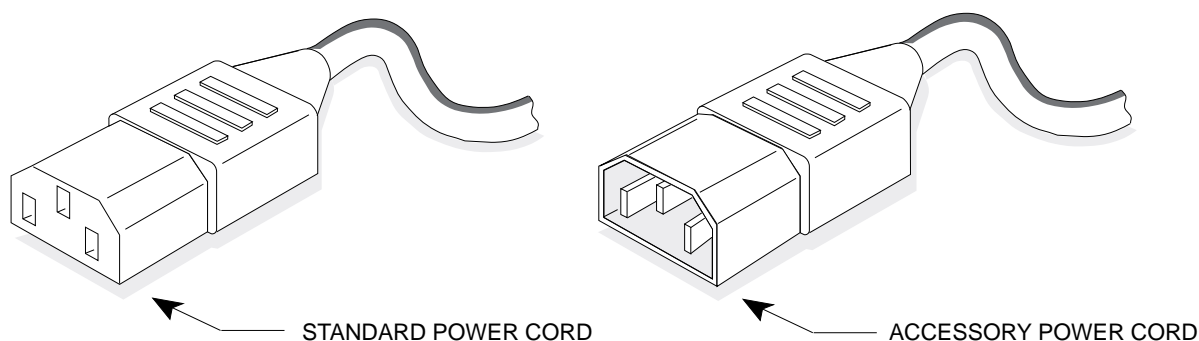


Eagle 550 Rear Panel Configuration

Power Supply AC Voltage and Receptacles

The voltage select switch shown in the rear panel illustrations is factory set to 115 volts. By simply sliding the switch to the opposite position, you can convert the power supply for 230 volt operation.

The power supply has one standard AC power receptacle and one AC accessory receptacle (typically used to supply power to a terminal or subsystem located close to your computer). One standard AC power cord is packaged with your computer. If you wish to use the AC accessory outlet, you can purchase the appropriate power cord from any retail computer store.



PREPARING THE SITE

For your computer to do its best job for you, you must place it in an environment it is comfortable in. Extreme temperature or humidity can cause computer failure. But, it is not very demanding—its environmental needs are similar to your own.

Physical Requirements

The first step is to make sure the place you want to put your computer is large enough and sturdy enough for it. Also, leave enough room for any terminals and printers you want to use.

Make sure the AC power cord will reach from the back panel to an electrical outlet, and that there are enough electrical outlets for all terminals and printers. You should also make sure you have enough terminal cabling to reach from the back panel of your computer to the terminals and printers. See the following section on "Power and Cable Connections" for more tips and suggestions.

Environmental Requirements

It is important to remember that the cleaner the environment, the more efficiently the computer performs. Treat your computer with respect. For example, do not place coffee cups or soda cans on top of the main enclosure where they can spill. If spilled liquid happens to reach the circuit boards inside the computer, it could cause computer failure.

In general, you should install your computer in an area where people do not eat, drink, or smoke, since all of these activities can cause contamination problems. Try not to place the computer in a high traffic area. This typically creates more dirt and dust which can clog the air intakes of the computer chassis. This will cause cooling problems because of the dirt accumulation. A side effect of a high traffic area is static electrical discharge which can cause system resets. This can be avoided by installing the computer in a better environment. For information on cleaning your computer and taking care of its components, refer to Chapter 6, "Preventive Maintenance."

When you select a location for your computer, remember that it operates within certain temperature and humidity ranges. Air circulation around the system is something that should be considered. Do not put a computer in a closed closet where there is no cooling. See the separate specification sheet for detailed requirements.

It is very important for the health of your computer that you do not obstruct its cooling system. The computer takes air in from the front and bottom and exhausts air at the rear. °The mounting feet give it adequate ventilation space below. °Allow **at least** six inches at the rear of the unit for ventilation. °Do not place the computer on a carpet which can block the air intakes on the bottom of the system.

Static Electricity

Slight problems with the computer can often be traced to problems with static electricity or improper grounding.



If you have problems on dry and windy days when humidity is low, static electricity could be your problem.

If, however, your problems occur when equipment near the computer is turned on—for example, if your computer stops functioning when someone uses the photocopier—improper grounding could be your problem. We recommend a low impedance power conditioner be used to filter out these power problems. Alpha Microsystems can provide the approved power conditioner type. Ask your VAR for further details.

One of the greatest enemies of computers, terminals, and printers is static electricity. The chief villain is climate: dry winds and dry seasons. You should also be aware that both carpets and the plastic mats often used under desks are a prime source of static electricity.

If possible, you should place your computer in an uncarpeted area. If you must place it in a carpeted area where static electricity could be a problem, you should treat the area with anti-static spray on a regular basis.

Several anti-static sprays on the market can be of considerable help during days when static electricity is a problem. Also, using an air conditioner that controls humidity can greatly reduce a static electricity problem.

Power and Cable Connections

Before selecting a site for your computer, you should determine if the area where you want to place the computer has adequately regulated AC power. If you request it, many power companies will install test equipment to determine if there is a need for additional line regulation. Testing line voltages may also be done through the use of a high speed line transient recorder. If, over a period of several days of testing, the line voltage varies more than 10 percent from the rated line voltage, you may need to install a power conditioner and a new dedicated ac power circuit. AM computers require a properly grounded power outlet for the system to run correctly.

A "transient free," or smooth and consistent, power source and a properly installed earth ground can significantly improve the reliability of your computer. While the computer is in use, it is important to maintain a constant line voltage free of power surges, fluctuations and impulses. Ideally, a separate power source should be available for use only by the computer. However, if this is not possible, you may need a line conditioner capable of suppressing transients or spikes to eliminate power surges and noise.

Be sure the power rating for the power lines the computer will be connected to is adequate for your computer or any future systems you may be planning to install. In North America, a standard 15 amp 115 volt grounded connector-type outlet is required for the CPU chassis. In some other countries, the requirement is a 230 volt AC power source.



The maximum power requirements for the computer are:

115 Volt AC at 5 amps, or
230 Volt AC at 3 amps

Additional outlets are required for each I/O chassis and/or peripheral connected to the computer. Alpha Micro computers come with a standard six-foot power cord. If this is not long enough, be sure any extension cords used are rated for the full 15 amps—otherwise, the full voltage will not reach your computer. This can affect the efficient operation of your computer.

A point to remember is that the closer you get to either end of the AC voltage power range, the less efficient the computer will be.

To avoid electrical interference, sources of electrical noise such as air conditioners, copiers, electric typewriters or cleaning equipment should not be connected to the same power circuit as the computer. All outlets providing power to the computer should have a common grounding point restricted to only those connections coming from the computer installation.

Data cables should not be located near high voltage power lines, power transformer telephone cables, or in elevator shafts. They should not cross walkways. If you must cross walkways, cover the cables with a cable bridge.

You must also take cable lengths into consideration. Single-ended circuits are susceptible to all forms of electromagnetic interference. As line length increases beyond fifty feet, the reliability of the RS232C cable connected to the terminal and printer decreases rapidly. If local terminals are to be located further than fifty feet from the computer, we recommend you use low capacitance twisted-paired overall shielded cables. If this cable does not solve your problem then signal conditioning equipment will be needed to improve the signal.

VERIFYING VOLTAGE COMPATIBILITY

Different parts of the world use different standards for electricity. For example, most areas of the United States use 115 volt electricity. Many other areas of the world use 220—240 volt electricity.

Verify the input voltage before plugging in your computer. The illustration of the back panel earlier in this chapter shows the location of the input voltage switch.



If your computer is not set to the voltage you require, **do not** change the switch setting without checking with your VAR first. Your VAR will insure that you have the proper input voltage switch setting and power cord for your installation.

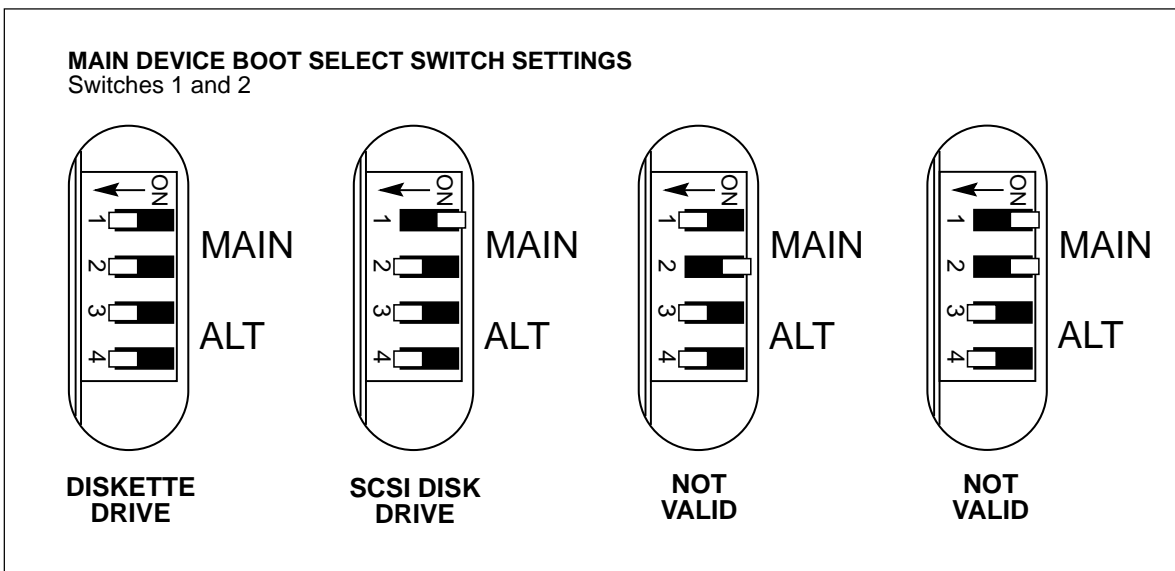
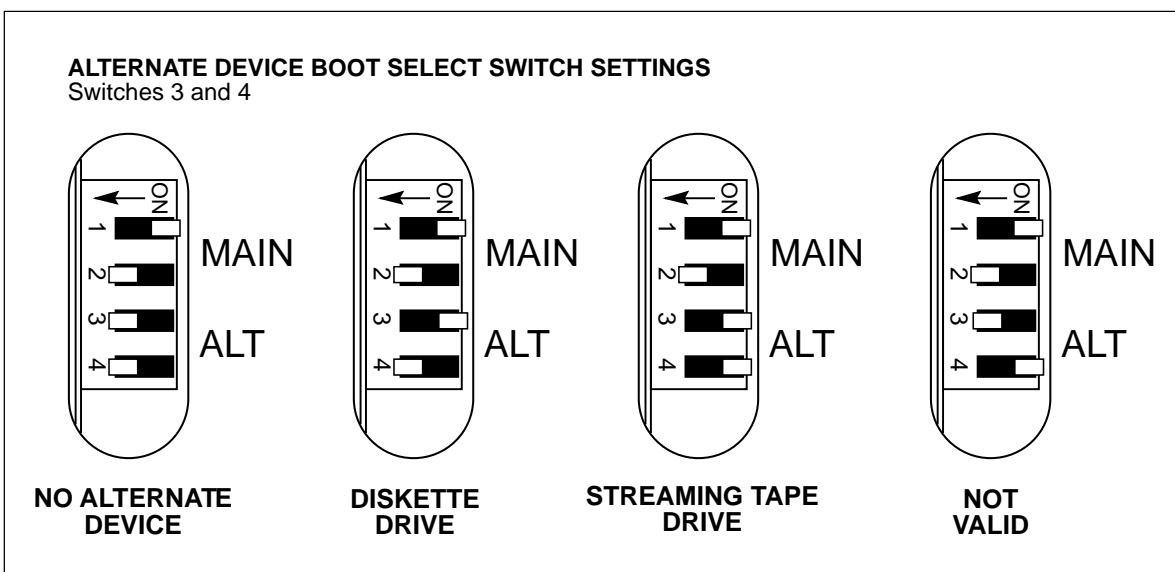
VERIFYING THE BOOT ID SWITCH SETTINGS (EAGLE 100-500 COMPUTERS ONLY)

The boot ID switches on the back panel of your computer are usually set for you at the factory or by your VAR. The switch settings define what hard disk drive/backup device combination your computer uses to boot from.

When you press the reset button, the computer reads the system initialization command file and the system monitor to get itself up and running. You can select which device the computer reads these files from by changing the boot ID switches. These four toggle switches are accessible through a small opening in the back panel of your computer. The word BOOT is silkscreened just below the opening where the four boot switches reside.

The switches are numbered from top to bottom (1-4). Switches 1 and 2 are for the main boot device; switches 3 and 4 select the alternate boot device.

The following diagram shows the various switch settings for both main and alternate devices:

MAIN DEVICE (as viewed from your computer's rear panel)**ALTERNATE DEVICE** (as viewed from your computer's rear panel)

MC1054

Eagle 100-500 Boot Switch Settings

EAGLE 550 SPECIFIC FEATURES

The new EAGLE 550 system has additional features that distinguish it from all other Eagle systems. These new features include:

Expanded Rear Panel

A new rear panel has been designed for the Eagle 550 system to provide more versatility and flexibility. Two SCSI ports allow external connection to a disk expansion box or RAID subsystem. The rear panel supports four DB-25 parallel printer ports and seven paddle board SIO expansion slots. The main system board provides four on-board RJ-45 serial ports, a 9-pin UPS port, 10baseT and AUI Ethernet connectors.

CMOS Menu Setup

The CMOS setup procedure gives the user many boot options never before available. Among the CMOS menu options are:

- Selection of any hard disk I.D. number as the primary boot disk (unit #0 - 6)
- Selection of any tape device as an alternate boot device (unit #1 - 6)
- Operator entry to boot the system with any valid Monitor and/or Initialization file name, located in [1,4] of the selected boot device
- Selection between the AUI or TPI port for Ethernet connection

New Real Time Clock

The system has a new Real Time Clock chip which is part of the CMOS system setup. Both the CMOS boot settings and the time and date are battery backed-up. The new Real Time Clock is more efficient than previous systems, and provides time and date protection with a software "lock".

Uninterruptible Power Source Connection

The Eagle 550 system has an on-board UPS port. This port is a switch contact status port, as used with the Toshiba UPS products sold by Alpha Micro. In the normal configuration this port will connect to the UPS and can control (turn off) the disk write cache during a low battery, or AC power fail condition. This function flushes all pending writes to disk, thereby saving your data automatically. When the power is restored, the UPS flags the system and the disk write caching is automatically re-enabled.

Four High-Speed Parallel Printer Ports

There are four on-board, high-speed, parallel printer ports that use the new SEP.DVR interface driver. The ports are Centronics compatible with a new FIFO design to off-load character interrupts. The new FIFOs can buffer up 4000 characters, and interrupt the CPU only after all characters have been printed. This gives the CPU more clock cycles to do other things while printing.

System Versatility

The AM319-20 system board was designed to work in both the Eagle chassis and the AM-990 system chassis with the capability to use either type of front panel status display. The 20-pin connector is used for the Eagle status display, and the 26-pin connector is used for the AM-990 status display. When system requirements increase beyond the physical capacity of the Eagle chassis, you can expand your system by simply migrating all internal components to the larger AM-990 chassis.

Serial I/O Paddle Card Expansion Bus

The AM319-20 system board will accept standard Alpha Micro serial I/O paddle cards. Although you can use the older AM-355 serial I/O paddle cards with this system, it is highly recommended that the AM359-00 optically isolated serial I/O card be used for system stability. This is the first Eagle product to offer the optical isolation feature. Additionally, the main system board comes with four RJ-45 Super I/O compatible serial ports built on-board. The RJ-45 ports are pin-for-pin compatible with the AM-359 serial I/O paddle card ports, so the same type cabling can be used for both.

AM-219 Floppy Controller Interface

The AM-319-20 system board provides on-board connection for the AM-219 enhanced floppy controller board. The AM-219 board can interface with a 5-1/4" and/or a 3-1/2" floppy drive. A maximum of two floppy drives can be used in the system.

New Ethernet Interface

The Eagle 550 Ethernet interface design has been improved over other Eagle systems. The new design allows more data to be buffered before the CPU has to service the request. The new interface also puts the Ethernet data into main system memory faster than other system models, and has both the AUI and TPI interface connectors built right on the main system board. Selecting which port will be active is controlled by the CMOS setup menu. *NOTE:* As of this writing the AM-319-20 Ethernet interface is AlphaTCP compatible only, with AlphaNet not currently supported.

THE EAGLE 550 CMOS MENU

The boot switch on the Eagle 550 has been eliminated and its previous functions have been enhanced and expanded. All system boot parameters are now stored in CMOS RAM which is battery backed-up. The CMOS RAM is also write-protected so runaway user programs will not destroy your settings.

There are a few requirements connected with using this feature. The boot PROM on the Roadrunner board must be revision L00 or later. To edit the CMOS configuration menu a terminal configured for 19.2K baud must be attached to port 0 on the Eagle 550 system board. If you wish to use the floppy boot feature, the most recent 219DVR.DVR floppy driver must be used when creating the new boot monitor (MONGEN) and saved on the diskette.

EAGLE 550 CMOS INITIALIZATION ROUTINE

Before relying on the CMOS parameters, the Roadrunner boot code checks the validity of the CMOS contents by verifying the parameter checksum. If the checksum verifies OK, the system will boot using the previously stored CMOS parameters. If the checksum does NOT verify (for example, if the battery back-up fails), the front panel will blink the code "CE" for several seconds to inform the user. Next, the boot code will display a code of "CC" while it performs a test of the CMOS RAM to insure that it's working. If the test fails, the code "CF" is displayed and the system is halted. If the test passes the operator has two options: let the system continue to boot using the default set of parameters (as shown below), or pressing when the front panel displays the code "CS" (you have approximately three seconds), to access and setup the CMOS configuration menu as normal.

Eagle 550 CMOS Menu Options

You may enter the CMOS setup routine at any time by pressing system reset and waiting for the code "CS" to appear on the front display panel. Once the code appears you have approximately three seconds to press on the main boot terminal keyboard to access to the CMOS configuration menu. If is not pressed, the system will continue with the boot process using the CMOS parameters already set. Upon entering the CMOS configuration mode the following user menu is displayed.

```

                        ALPHA MICROSYSTEMS
                Super Eagle CMOS Configuration Menu

Primary boot device type..... SCSI Disk

Primary boot device unit #..... 0

Alternate boot device type..... Streamer

Alternate boot device unit #... 3

Boot monitor file name..... AMOS32.MON

Boot initialization file name.. AMOS32.INI

Network interface type..... TPI

Use [UP] and [DOWN] keys to select an item.
Use [LEFT] and [RIGHT] keys to change item.
Press [ESCAPE] when done.
```

As is indicated on the screen, the UP and Down arrow keys are used to select a parameter. To change a parameter the Left and Right arrow keys are used to 'cycle' through the possible settings of a parameter. The only exceptions are file names.

Primary Boot Device Type

This parameter selects the type of device to boot from in the event that the attempt to boot from the alternate device fails or is not selected. Currently, only SCSI and floppy drives can be selected as the primary boot device.

Primary Boot Device Unit

This parameter selects which primary drive number to boot from. Valid unit numbers for SCSI drives are 0-6. Valid unit numbers for floppy drives are 0 and 1. The setup routine will not allow you to select an invalid unit number.

Alternate Boot Device Type

This parameter selects the type of device to attempt to boot from first, before defaulting to the primary boot device. Currently supported alternate boot devices are Floppy, Streamer or None (boot from primary device only).

Alternate Boot Device Unit

This parameter selects which alternate device number to boot from. Valid unit numbers 0-6 for SCSI streamers drives, and 0 or 1 for floppy drives. The setup routine will not allow you to select an invalid unit number. Remember you should know how many devices you currently have on the system before you enter this number. If you select a number and the device is not found, it will go to the primary boot selection.

Boot Monitor File Name

This parameter allows the user to change the name of the monitor file to be loaded during boot. Any valid file name may be entered. The monitor file must exist, and reside in account [1,4] of the first logical disk of the selected boot device. This parameter is not used when booting from a tape device. Backspace and the arrow keys are used when editing this field. **If the file name is smaller than 6 characters you must pad this field with trailing spaces.**

Boot Initialization File Name

This parameter allows the user to change the name of the system initialization (INI) file to be used during boot. Any valid file name may be entered. The INI file must exist, and reside in account [1,4] of the first logical disk of the selected boot device. **As with the boot monitor option, if the file name is smaller than 6 characters you must pad this field with trailing spaces.**

Network Interface Type

This parameter specifies which ethernet interface connector to use. There are two possible selections: °AUI (DB-15), ° or ° TPI (RJ-45) 10baseT.

When done making changes press . A message will appear at the bottom of the screen asking if you wish to save any changes made. Enter "Y" to save the changes in the CMOS RAM, or "N" to abandon any changes made. After entering your response, the system will boot using whatever parameters have been saved in the CMOS setup.

Important Notes:

If you wish to boot from a physical disk device other than device I.D. 0, it is **NOT** necessary to create a corresponding disk driver for the selected drive I.D. and MONGEN it into the monitor. If the monitor has been created with the generic SCZRR.DVR, then the Roadrunner's boot PROM will use the data stored in the CMOS parameters to set the selected drive I.D. (unit number) within the monitor *after* the monitor is loaded.

If you have more than one physical drive and wish to use the additional drive as a DSK device also, the additional drive(s) must be identical to the boot drive, and must be sequentially addressed *after* the selected boot drive I.D. (unit number). As your system initialization file is processed, the next DSK drive defined in the file will be automatically mapped to the next higher SCSI I.D. number.

For example:

Your system contains 3 hard disk drives. The first drive is a (6) logical Maxtor, addressed at SCSI I.D. 0. The next two drives are identical (11) logical Quantum's, addressed at SCSI I.D. 1 and 2. You want to use the two Quantum drives as DSK devices and the Maxtor as a SUB device.

In the CMOS configuration menu you must select the primary boot device type as SCSI Disk, and the primary boot device unit # as 1. You must have previously loaded the selected boot drive with a bootable version of the AMOS operating system software containing the designated boot monitor and INI files. You must also create a subsystem disk driver for the Maxtor drive using the FIXLOG program and the generic SCZRR disk driver, and assign it to SCSI I.D. 0.

In your boot INI you must define the two Quantum drives as DSK1:-DSK10:, and DSK11:-DSK21: as you normally would. You must also define the Maxtor drive as SUB0:-SUB5: (or whatever device name you choose).

As the system begins the boot sequence, the CMOS configuration data is used to determine the primary boot type (SCSI Disk) and the primary boot device unit # (SCSI I.D. 1 -- the first Quantum drive). As the system initialization file is processed, the second Quantum drive (DSK11:-DSK21:) will be automatically mapped to SCSI I.D. 2 (the next sequential I.D.). This is why additional DSK drives must *always* be sequentially addressed after the primary boot device I.D.

The subsystem device (in this example the Maxtor drive) will be accessed via the SUB driver which was created using the FIXLOG program and SCSI I.D. 0. In actuality, a subsystem device can be assigned to any valid SCSI I.D. which is not already in use. Simply use the FIXLOG program to create the corresponding driver.

The above example holds true for all hard disk drives, but has a slightly different effect if you're booting from a floppy drive. For example, if you boot from the 2nd floppy drive, then that drive becomes DSK0:. If the INI file used during the boot process defines a DSK1: device, then all accesses to DSK1: will be sent to the 1st floppy drive. The drives become reversed, ie. DSK0: refers to floppy drive 1, and DSK1: refers to floppy drive 0.

TURNING THE COMPUTER ON

Important Note: Once you turn on your computer, you must be very careful never to move it while power is still on; doing so could damage the disk drives inside the unit. "Turning the Computer off," at the end of this chapter, gives information on how to correctly turn the computer off before moving it.

1. Verify once again that your computer has been configured correctly for the AC power service in your region.
2. Place the computer in the site you have chosen for it. Insert the socket end of the AC power cord firmly over the three prongs in the power cord receptacle located in the back panel. (See the figure at the front of this chapter.) Then plug the pronged end of the cord into an electrical outlet.
3. Remove the packing material from any diskette drives. (Remember to put this packing material back into the drives if you should have to move the computer.)
4. Turn on the computer by pushing the power button located on the front panel.
5. Now, check to make sure power is on:
 - a. Are the power and run lights on the front panel lit? (See the earlier figure.)
 - b. Is the cooling fan running? To check the fan, place your hand behind the fan opening in the back panel; you should feel air blowing out.

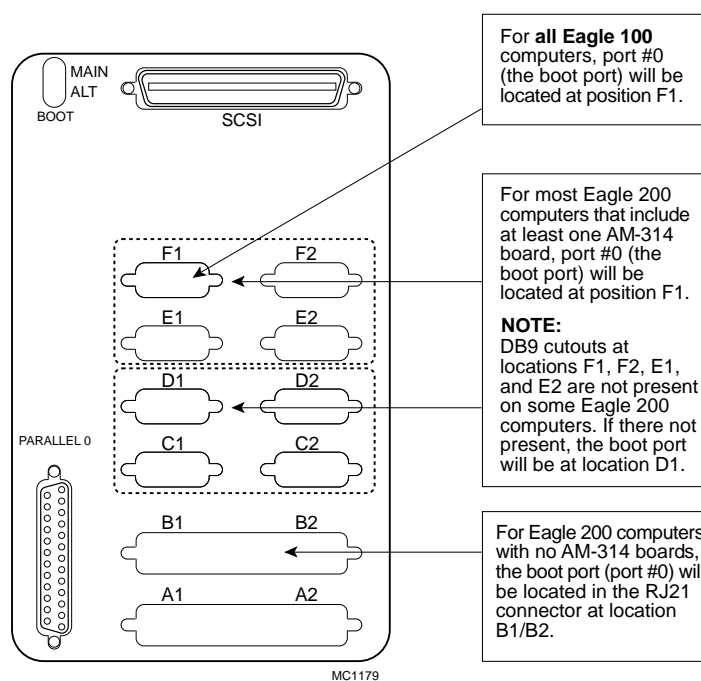
If the power and run lights and the fan are not on, you have a problem. Refer to Chapter 7 for troubleshooting help. If the fan and the power and run lights are on, you can proceed with installing the operator terminal. But first, turn the computer back off.

INSTALLING THE OPERATOR TERMINAL

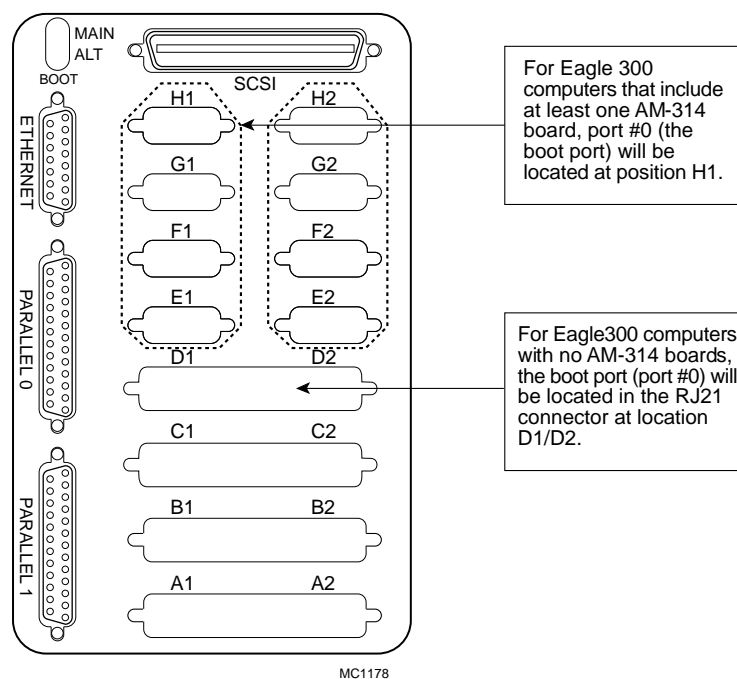
The terminal you use when installing software and running diagnostic programs is called the operator terminal.

There are two basic things you must do to install the operator terminal: set its operating parameters, and connect a cable between it and serial Port #0 on the back panel. Where you connect the operator terminal cable on the rear panel of your computer depends on the model of your Eagle computer and the type of I/O board you ordered.

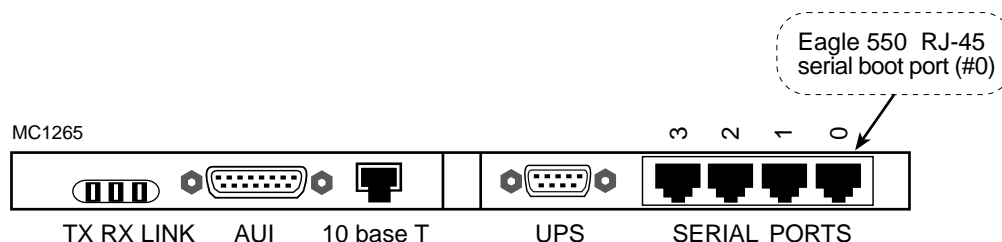
The next few illustrations show boot port locations for the various Eagle systems.



Eagle 100 and 200 Boot Port Locations



Eagle 300-500 Boot Port Locations



Eagle 550 Boot Port Location

Setting the Terminal's Baud Rate and Parameters

AMOS initially assumes the operator terminal is an Alpha Micro or compatible terminal using RS232 signals. It also assumes the terminal is working at 19200 baud. (The "baud rate" is the rate at which the terminal and computer transfer information between themselves; if the terminal is not set at the baud rate the operating system thinks it should be using, the text displayed on the terminal is not legible.) AMOS also assumes the following terminal parameters:

| | |
|---------------------------------|-----------------|
| Data Word Length: | Eight data bits |
| Parity: | No parity |
| Stop Bit (110 baud): | Two stop bits |
| Stop Bit (other than 110 baud): | One stop bit |

Refer to the documentation accompanying your terminal for information on setting its baud rate and the parameters listed above.

Once the computer is booted with a compatible terminal, you can define your own type of terminal and tell the computer to use that terminal from now on. For more information on defining your own terminal, refer to the *System Operator's Guide*.

Connecting the Cable

Note: Refer to the FCC warning concerning electromagnetic interference at the front of this manual. The terminal cables you use must be shielded to minimize such interference. Also, see the section "Power and Cable Connections" elsewhere in this chapter.

Make sure you have appropriate cables for connecting the terminal to the computer. See Appendix A in this manual for cable guidelines. If you do not have the proper cables, please contact your VAR.

Plug one end of the finished cable into the proper connector on the back of the terminal and the other end into the appropriate connector on the back of the CPU chassis. Alpha Micro cables are labeled at each end to indicate which end plugs into the CPU, and which end goes to the terminal.

INITIAL TESTING

Before you boot the computer under AMOS, or hook up any printers and additional terminals, you should use the self test feature to verify that the hardware is working correctly. For full information on the self test, refer to the self test user's guide shipped with this owner's manual. Perform the self test now before proceeding to the next section.

BOOTING UP UNDER AMOS

Normally, the AMOS system software is installed by Alpha Micro before the computer leaves the factory. If this is the case, all you need to do to bring the computer up under AMOS is turn the computer on. Follow these steps:

1. Turn on your terminal and any other peripheral devices such as a printer.
2. Press the AC power button on the front panel.

If the system software is already on your hard disk, within a few seconds you will see a succession of boot codes on the front panel status display, then system initialization file commands appear in rapid succession on the operator terminal screen as they are executed.

If nothing appears on the status display or the terminal screen after a minute's wait, follow the instructions below to install the operating system onto your System Disk.



When the computer is up and running, the front panel LED will display a zero.

INSTALLING ALPHA MICRO SOFTWARE

If the AMOS software is not already installed on your hard disk, you should have received a system software tape from your VAR along with the computer. If you did not, contact your VAR for help.

If you do have the system software tape, you need both it and a "warm boot" tape supplied by your VAR in order to install your system software. Installing the software on your computer involves copying the latest system software from a tape to your hard disk. Additionally, other software packages can be installed from a CD. AlphaCD contains all released software which can be copied from a logical disk on the CD to your system disk drive.

The tapes are accompanied by the *Release Notes* for the particular software release shipped with your computer. This document describes the most recent features incorporated into the software, and contains current instructions for transferring the files to your hard disk. The installation instructions in the *Release Notes* give you all the details for getting your computer up and running.

To install the system software from a streaming tape to a new computer, you need to:

1. Make sure power to the computer is turned on. Check that the boot ID switches are set to streaming tape. See "Verifying the Boot ID Switch Settings" earlier in this chapter for details, or the CMOS setup procedure for Eagle 550 systems.
2. Insert the warm boot tape into the tape drive.
3. Press the reset button on the front panel of the computer.
4. When the following message and cursor appear on the screen about a half minute later, it means the computer booted successfully from the warm boot tape.

```
AMOS          Version xx.x
```

5. Remove the warm boot tape. Insert the system software release tape. Transfer data from the tape onto the disk with this command:

```
MTURES DSK0:=ALL:[ ] 
```

When the installation finishes, verify that a valid Initialization file and monitor file is present, then push the reset button on the front of the computer. The computer should boot, and you should see the system initialization file commands on the operator terminal screen, as described above.

The Warm Boot Monitor

The warm boot monitor is used in case of an emergency, when the computer cannot find the system software files it needs to boot from on the hard disk.

As you become more familiar with your computer, we strongly recommend you create several warm boot tapes. In addition, if you ever change the configuration of your computer, you will almost certainly want to generate all new warm boot tapes.

Use the WRMGEN program to generate a warm boot monitor, and the appropriate backup command to place the monitor onto a tape. See the *AMOS User's Guide* and the *System Commands Reference Manual* for details on these procedures.

TURNING THE COMPUTER OFF

You need to turn off the computer whenever:

- You add to, or modify, the circuit board configuration.
- You move the computer or servicing is required.

To turn off the computer always follow these steps:

- 1.°°Make sure all users have exited all programs and are logged off the computer.
- 2.°°Remove any backup media (such as diskettes) from the computer.
- 3.°°Turn off all external devices such as printers and terminals.
- 4.°°Press the AC power button on the front panel.

EXPANDING YOUR COMPUTER

Your Alpha Micro VAR can assist you with setting up, expanding or servicing your computer.

Once your computer is configured with the basic components, you may want to install any additional sub-systems purchased with your basic computer. Or, you may want to change your basic configuration to add more users, change memory allocations, etc.

Part of adding new hardware to the computer involves changing the system initialization command file to define the new hardware to it. Changing the allocation of system resources also requires changing the system initialization file. For information on modifying this file, refer to the *System Operator's Guide to System Initialization*.



Please read that document carefully; modifying the system initialization command file without understanding its elements is very dangerous—a serious mistake could damage the file and leave your computer unable to boot from your System Disk. **NEVER** modify the file directly. Make a copy of it; then change and test (MONTST) the copy.

GETTING ASSISTANCE

If you have followed all of the instructions in this chapter, but for some reason your computer is not working, you probably want help. First, please turn to Chapter 7, "Troubleshooting," and see if one of the problems listed in "The Symptoms," is one you are experiencing. If the solution in that chapter does not cure your problem, or if your problem is not listed, it's time to get some outside help—call your VAR.

CHAPTER 3

GETTING STARTED

This chapter contains two types of information: basic concepts about the way your computer is set up and operates, and general procedures for working with it. Specific topics include:

- Booting the computer.
- Device names and the System Disk.
- Disk accounts and user names.
- Logging on to the computer and transferring between disk accounts.
- Your terminal keyboard.
- Working with diskettes and streamer tapes.

BOOTING THE COMPUTER

Booting is the process the computer goes through whenever you turn the power on or press the reset button. When you boot, a pre-programmed circuit built into the computer, called a PROM (Programmable Read-Only Memory), tells the CPU where to look on the disk for the software necessary to get the computer up and running. The CPU reads this software from the disk, loads it into the computer's internal storage area, its "memory," and executes its instructions.

Among the files transferred into system memory when you boot is the system initialization command file. The system initialization file is a special command file containing commands that define to the operating system (AMOS) all the hardware connected to your system. As the computer boots, it reads these commands and "builds" the operating system in memory correctly for your configuration of hardware. You can change the system initialization file whenever you want to add more hardware to your system.

If you want to learn more about the system initialization file and how to modify it, read Chapter 5 of this book. Read the *System Operator's Guide to System Initialization* for more details.

As the computer processes the commands in the system initialization file, each line of the file displays on the operator terminal. When all of the commands in the initialization file have been processed successfully, the computer is up and running. The last command in any system initialization file is `MEMORY 0`. When you see `MEMORY 0` on the operator terminal, and the front panel status display changes to blank, the computer has finished booting.

DEVICE NAMES

Device names are how AMOS identifies the different pieces of equipment that make up your computer. Each disk drive and other storage device has its own device name (terminals and printers are defined somewhat differently). These device names are defined in the system initialization file.

Alpha Micro device names conform to a specific format to make it easy for you and the computer to refer to the same piece of equipment. All device names contain three letters and a number, and end with a colon (:). For example, `DSK#:`, where # is a number, is usually the name for a hard disk device and `STR0:` is the name of a streaming tape drive.


Having names for each device lets you specify which device you want to use for a specific command. For example, you can see a list of files from just one of your disk drives, or copy data from your hard disk to a diskette.

You can set up your computer to use each hard disk drive as if it were two or more separate devices. In this case, the actual disk drive is called the "physical device" and each portion of it is a "logical device." This is an important distinction, since in most cases with AMOS you refer to the logical device name. For example, a single 240MB hard disk drive could contain devices named `DSK0:`, `DSK1:`, `DSK2:`, `DSK3:`, and so on.

The disk device containing your system initialization command file and other system software, the device AMOS "boots from," is always called `DSK0:`. Normally this is the first logical device on the hard disk, but if for some reason you boot from your diskette drive, the diskette drive becomes `DSK0:`. When you change the device you boot from, it may also change the names of other devices on your computer—since you are using a different system initialization command file the devices may be defined differently.

For example, if your computer contains one hard disk drive, split into three logical devices, and one diskette drive:

- When your computer boots from the hard drive (the usual state of affairs), the hard drive would be referenced as three disk devices named `DSK0:`, `DSK1:`, and `DSK2:`. The diskette drive is named `FLP0:` if it takes 3¹/₂" diskettes, and `MIN0:` if it takes 5¹/₄" diskettes.
- If you modify your computer to boot from the diskette drive, the hard drive might be referenced as three disk devices named `WIN0:`, `WIN1:`, and `WIN2:`, and the diskette drive is named `DSK0:`.

Remember, this is only an example. Your computer may be set up to reference the hard disk as more or fewer than three logical devices. If you want to see a list of the hard and diskette disk devices on your computer, type SYSTAT and press ; the end of the display lists the available disks.

At some time in the future you might decide to change the number of logical devices on your hard disk. This is a sophisticated procedure, so for detailed instructions, see the document "Configuring Winchester Disk Drivers" in the *System Operator's Guide*, and follow the FIXLOG reference sheet in the *System Commands Reference Manual*.

The System Disk

The System Disk, DSK0:, is where the system software is stored, and where the computer looks for it when the computer boots. Usually, DSK0: is on your hard disk, but you can also set up your system to boot from a diskette, in which case the diskette drive would be DSK0:.

If you have a magnetic tape drive included with your computer, you also have the option of booting from this device if you are unable to boot from your hard drive. Booting from a tape medium is known as a "warm boot," and is usually reserved for special circumstances when it's not possible to boot from your normal System Disk on the hard drive.

DISK ACCOUNTS

Disk accounts are an organizational feature your Alpha Micro computer uses to help you keep track of your data. Instead of making you search through one enormous list of files for the specific one you're looking for, the AMOS operating system is designed to group files into "accounts."

Accounts are identified by a two part account number. The two numbers are separated by a comma and enclosed in brackets. The first number is called the project number, the second part the programmer number. [1,2], [200,0], and [34,11] are examples of account numbers. Since they are actually octal numbers, the digits 8 and 9 aren't used, and the highest possible number is [377,376].

The two part structure of the account number allows you another level of organization. Besides grouping files into accounts, you can group related accounts in the same project. For example, all accounts containing files dealing with payroll may be in project 50 ([50,0], [50,1], etc.).

You can also assign a password to each account if you wish, as a security measure. Anyone who doesn't know the password cannot log into the account. See Chapter 5 for how to assign passwords.

Accounts are called "disk accounts" because each account is specific to a particular device—usually a disk. For example, you may have the account [63,1] on both DSK0: and DSK1:. Though these accounts have the same account number, since they are on different devices they are different accounts, and contain different files.

You can see a list of all the accounts on any device on your computer using the PPN command. Type **PPN** and the name of the device you want the list for, and press **RETURN**. For example, to see all the accounts on DSK0:, type:

```
PPN DSK0: RETURN
```

You can also see a list of all the files in any account, using the DIR (short for *directory*) command. To see a list of the files in the account you are currently in, type:

```
DIR/W RETURN
```

While you can use DIR to list the files from any account, to access the files in an account, you must usually log into it, as described later in this chapter.

Now that you have a general idea of what disk accounts are and how to use them, you can decide how you want to organize your own files into accounts. If you want to create more accounts on a diskette or your hard disk, see Chapter 5.

You can find more information on the PPN and DIR commands in the *System Commands Reference Manual*.

LOGGING ON

The LOG command serves two purposes: it identifies you to the computer and lets you choose what disk account you want to access. When you first log on to the computer—either after logging off or after booting the system—you must tell the computer who you are and what account you want to use. You can do this by entering the disk account you want. For example:

```
LOG [25,1] RETURN
```

If your computer uses user names, LOG now asks for your user name. Type it and press **RETURN**.

If your computer uses user names, you can also enter your user name in the LOG command instead of an account number. This logs you into the root account defined when your user name was set up. For example:

```
LOG CARRIE SMITH RETURN
```

This logs you into Carrie Smith's root account.



You can assign passwords to disk accounts. If the account you enter has a password, AMOS asks you for the password before logging you in.

Once you're logged on to the system, you can use LOG to switch to a different account. You don't need to enter your user name again, just the account you want. For example:

```
LOG [36,14] 
```

If the account has a password assigned, you are asked for the password before you transfer to the account.

The account number list for each device on your system is separate, so you may have duplicate account numbers on different disks. Therefore, to completely specify what account you want, you may need to enter both the device and account number. For example:

```
LOG DSK0:[7,12] 
```

You only have to enter the device name if the same account exists on more than one device. If the account you enter does not exist, you see a message on your screen indicating you've typed an invalid account number.

For more details about the LOG command, see the *System Commands Reference Manual*. For information about user names, see the *System Operator's Guide*.

THE TERMINAL KEYBOARD

The first step in communicating with AMOS is to be able to type your instructions on the terminal keyboard. The keyboard is very similar to a standard typewriter's, but it has a few extra keys with special functions.

Take a moment to look at your keyboard so you can easily locate these keys later:

| KEY | DESCRIPTION |
|------------------|---|
| RETURN | <p>RETURN (sometimes labeled ENTER or with an arrow that curves to the left) is the carriage return key. Just as you press the carriage return on a typewriter to begin a new line on the page, a RETURN tells the computer you are ending a line of input and you want to begin a new line.</p> <p>The computer does not normally process an instruction from you until you press RETURN to let it know you are finished with that line.</p> |
| RUBOUT | <p>RUBOUT is the deletion key; it backspaces AND deletes. It may be labeled RUB or DEL.</p> <p>If you make a mistake while typing an instruction to AMOS, you can erase it using the RUBOUT key.</p> |
| SHIFT | <p>The SHIFT key on most keyboards acts much like the shift key on a typewriter. By holding down SHIFT, you can type upper case letters and the symbols on the upper half of the keys with two symbols.</p> |
| CAPS LOCK | <p>While the CAPS LOCK key is enabled, letters you type appear in upper case. Keys other than letters are not affected by the CAPS LOCK key on most keyboards.</p> |
| ESC | <p>This key may be labeled ESCAPE or ALT MODE. It is used with several application programs (such as AlphaVUE) to signal the end of input, or to switch between command modes; however, you do not use ESC at AMOS command level.</p> |
| CTRL | <p>Use the CTRL (or CONTROL) key with other keys to enter a different kind of character—a "control character." AMOS and much of the software on the computer interpret control characters as special instructions.</p> <p>To type a control character, hold down the CTRL key and press the other key. For example, to type a Control-C, hold down the CTRL key and type the letter C. In this book, we indicate control characters this way: CTRL/C. Appendix B lists some of the control characters AMOS recognizes.</p> |

Correcting Typing Mistakes

You can correct any mistakes you may make while typing a command line as long as you have not yet pressed the **RETURN** key. You can:

- Press **RUBOUT** to erase single characters.
- Type **CTRL/U** to erase the entire current line.
- Type **CTRL/C** to tell AMOS to ignore the line.

See the table above for explanations of **RUBOUT** and control characters.

If you press the **RETURN** key before correcting your mistake, and the command you entered was not a valid AMOS command, AMOS lets you know it did not understand the command. For example:

```
. PRINT RETURN
?PRIMT?
.
```

(You meant to say PRINT.) After letting you know it does not understand the command, AMOS displays its prompt symbol. You can now try again.

If the AMOS line editor is enabled for the terminal you are using, you can recall a previous line to the screen by typing **CTRL/R**; then use the standard editing keys to change the line. In the sample conversation above, press **CTRL/R** at the AMOS prompt to recall the line **PRIMPT** to the screen, and use the **RUBOUT** key to back up and erase the incorrect characters. Then type the correct characters and press the **RETURN** key to enter the command again.

Your particular terminal undoubtedly has many features we haven't covered in this section. For complete information on using your terminal, refer to the owner's manual that accompanied it.

A WORD ABOUT DISKETTES

If your computer contains a diskette drive, that drive can either use 5¹/₄" or 3¹/₂" diskettes, depending on the drive.

If your drive uses 5¹/₄" diskettes, you will want to purchase blank, double-sided, double-density, soft sector, and 96 TPI 5¹/₄" certified diskettes.

If your drive uses 3¹/₂" diskettes, you will want to purchase blank, quad-density, 1.44MB 3¹/₂" diskettes.

A diskette consists of a soft or hard plastic jacket or case enclosing a thin disk of magnetically treated mylar on which your data is recorded. Never try to remove this plastic jacket—doing so will ruin the diskette.

Your VAR has ready-to-use diskettes available, containing software designed for Alpha Micro computers.

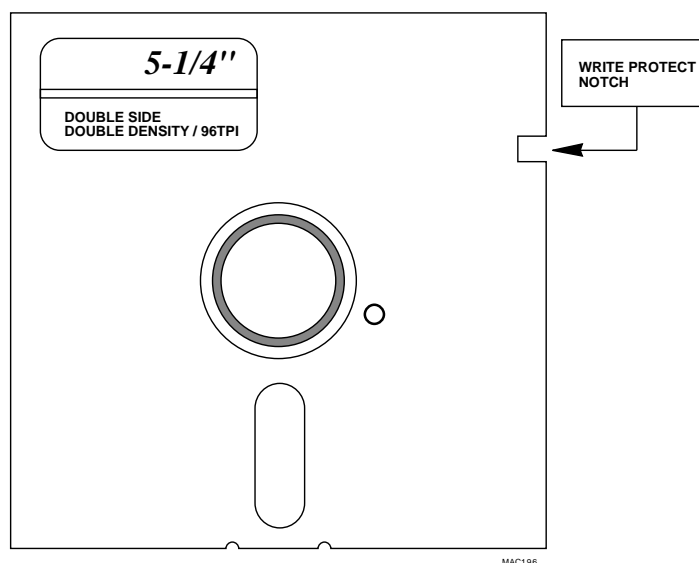
If you want to use empty, brand new diskettes to hold your own data, you need to perform a couple of simple steps before using an empty diskette for the first time. Please see "Formatting and Initializing a Diskette" in Chapter 5 for more information.

You should always have at least one diskette containing the AMOS system software, which you can use to boot your computer in the unlikely event you aren't able to boot from your hard drive. Take special care of your bootable diskettes, since if you do have problems with your System Disk, they may be the only way you can boot your computer.

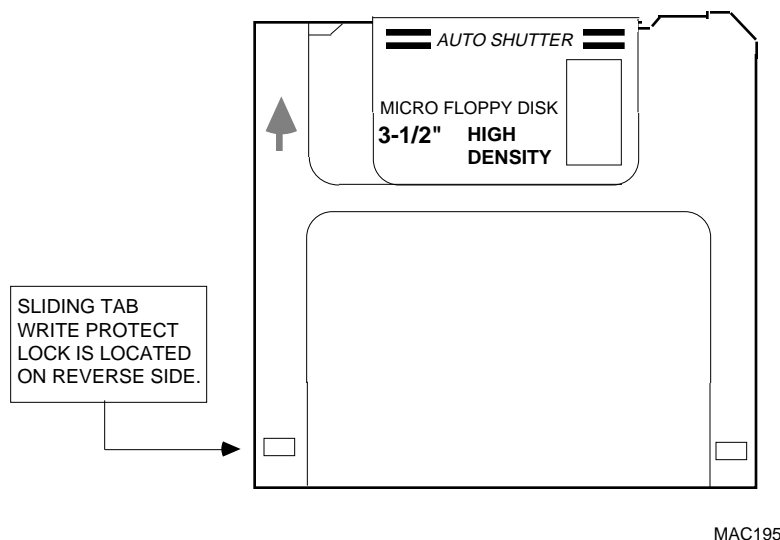
Diskettes have a finite lifetime, so be sure to make backup copies of your diskettes from time to time. The *System Operator's Guide* for your operating system version explains the procedures and commands for backing up data onto diskettes.

Using Diskettes

If you haven't used diskettes before, take a few minutes to look at one before you insert it in the drive. The figures below illustrate two types of diskettes.



5 1/4" Diskette



3 1/2" Diskette

If you are using 5 1/4" diskettes, look at the first figure above and notice the oval cutout in the plastic jacket. If you are using 3 1/2" diskettes, look at the figure above and notice the sliding metal door in the hard plastic case surrounding the diskette. The cutout or door is the window through which the disk drive reads the data on the more fragile diskette as the inner disk rotates within the jacket or case.

If you are using 5 1/4" diskettes, note the small notch in the side of the diskette jacket—this is the write protect notch. When this notch is covered with a small, self-adhesive tab, the drive cannot write on that diskette.

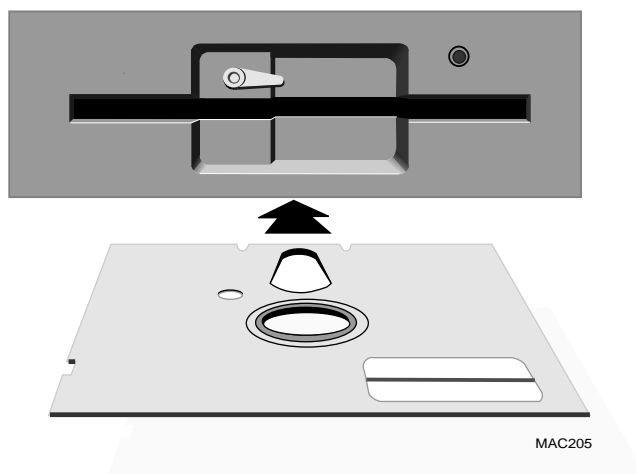
If you are using 3 1/2" diskettes, note the small, sliding tab that opens or closes a small square hole in the diskette case—this is the disk lock. By sliding the tab so it uncovers the hole, you write protect the disk so it can be read but not changed. By sliding the tab so it covers the hole, you allow the disk to be written on.

Remember to write protect any disks that contain valuable data—such as a bootable diskette—so they are guarded against accidental erasure. If you want the disk drive to write on a diskette, make sure the diskette is not write protected.

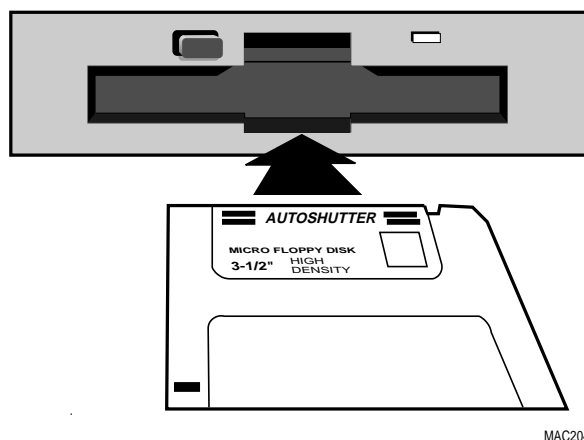
Always remember to label your diskettes by placing a self-adhesive label on them. We recommend you write on the label first, before you place it on the diskette. If you have to write on the label while it's on the diskette, use light pressure and a soft pointed writing instrument like a felt tip pen—otherwise you run the risk of damaging the diskette. (Of course, this caution doesn't really apply to 3 1/2" diskettes, which are contained in a much sturdier plastic case than 5 1/4" diskettes.)

When using diskettes, be sure to follow these precautions:

- [∞]Only insert a diskette into the drive when the computer is turned on—likewise, do not leave a diskette in the drive when you turn off the computer. Turning the computer on and off can cause power spikes that can damage the data on your diskette.
- [∞]Whenever you insert a diskette, be sure to use the MOUNT command (discussed below) to tell your computer a new diskette is in the drive.
- [∞]Never change diskettes if the drive is busy; doing so could damage the data on the diskettes. There is a small light on the front of the disk drive that is lit if the drive is busy.
- [∞]When you remove a diskette from the drive, store it in its envelope and place it in a box where it is protected from dust.



Inserting a 5¹/₄" Diskette



Inserting a 3¹/₂" Diskette

To insert a diskette, hold it so the side with the label is up and the cutout or door is pointing away from you.

For a 5¹/₄" diskette, open the drive door by turning the lever so it points toward the red indicator light. Insert the diskette so the oval cutout is on same side as the lever. Close the drive door by turning the lever 90 degrees clockwise. To remove the diskette, turn the lever back, 90 degrees counterclockwise.

For a 3¹/₂" diskette, push the diskette into the door until it is seated in the drive. To remove the diskette, push the eject button on the front of the drive.

Mounting Diskettes

Whenever you insert a diskette into the disk drive, you need to tell the computer you did so by using the MOUNT command. This is true even if you re-insert the same diskette you just took out. If you forget to use the MOUNT command, AMOS won't know which diskette is in the drive and when you want to write on the diskette, the data may get scrambled!

When you boot the computer, that process automatically mounts your boot device, DSK0:. You must mount any other disk devices in order to use them. For example, if your computer contains your boot device, DSK0:, and a diskette drive called FLP0:, you need to type the following MOUNT command at AMOS command level to access a diskette in the diskette drive:

```
MOUNT FLP0: 
```

Whenever you change the diskette in the drive, you must use the MOUNT command again.

ABOUT STREAMING TAPE

There are four different 1/4" streaming tape drives available for your computer: the AM-625, AM-626, AM-627, and AM-628. For information on transferring data to and from streaming tape, see the *System Commands Reference Manual*. For information on cleaning tape drive heads, see Chapter 6.

Tape Capacity

The storage capacity of your tapes depend both on the drive you have and the type of tape cartridge you are using. The following table shows the different types of tape cartridges available and the corresponding capacity for the AM-625, AM-626, AM-627, and AM-628 drives.



The cartridge tapes shown in the table below are the ones specified for use by the tape drive manufacturer. Using tapes other than those recommended may result in excessive head wear.

| Device | Data Cartridge | Maximum Capacity |
|--------|------------------|------------------|
| AM-625 | DC6037 | 40Mb |
| AM-625 | DC6150/DC600-XTD | 150Mb |
| AM-625 | DC6250 | 250Mb |
| AM-626 | DC6037 | 40Mb |
| AM-626 | DC6150 | 150Mb |
| AM-626 | DC6250 | 250Mb |
| AM-626 | DC6320 | 320Mb |
| AM-626 | DC6525 | 525Mb |
| AM-627 | DC6037 | 40Mb |
| AM-627 | DC6150 | 150Mb |
| AM-627 | DC6250 | 250Mb |
| AM-627 | DC6320 | 320Mb |
| AM-627 | DC6525 | 525Mb |
| AM-627 | MAGNUS 1.0 | 1000Mb |
| AM-628 | DC6037 | 40Mb |
| AM-628 | DC6150 | 150Mb |
| AM-628 | DC6250 | 250Mb |
| AM-628 | DC6320 | 320Mb |
| AM-628 | DC6525 | 525Mb |
| AM-628 | MAGNUS 1.0 | 1000Mb |
| AM-628 | MAGNUS 2.0 | 2000Mb |

1/4" Tape Drive Read/Write Compatibility

Streaming tape drives use many different data formats. The tape drives for your computer can use the following formats:

- AM-625: Reads and writes in QIC-150 18-track format. Can also read QIC-120 15 track, QIC-24 9-track, and QIC-11 4-track formats.
- AM-626: Reads and writes in QIC-320 26-track and QIC-150 18-track format. Can also read QIC-120 15 track and QIC-24 9-track formats.
- AM-627: Reads and writes in QIC-1000 30-track, QIC-320 26-track, and QIC-150 18-track format. Can also read QIC-120 15 track, and QIC-24 9-track formats.
- AM-628: Reads and writes in QIC-2GB 42 track, QIC-1000 30-track, QIC-320 26-track, and QIC-150 18-track format. Can also read QIC-120 15 track, and QIC-24 9-track formats.



This information is based on hardware capabilities. Some software may have further restrictions on tape format.

Loading and Unloading Tape Cartridges



To avoid damaging static discharge, always ground yourself by touching the metal chassis before loading or unloading a tape cartridge.

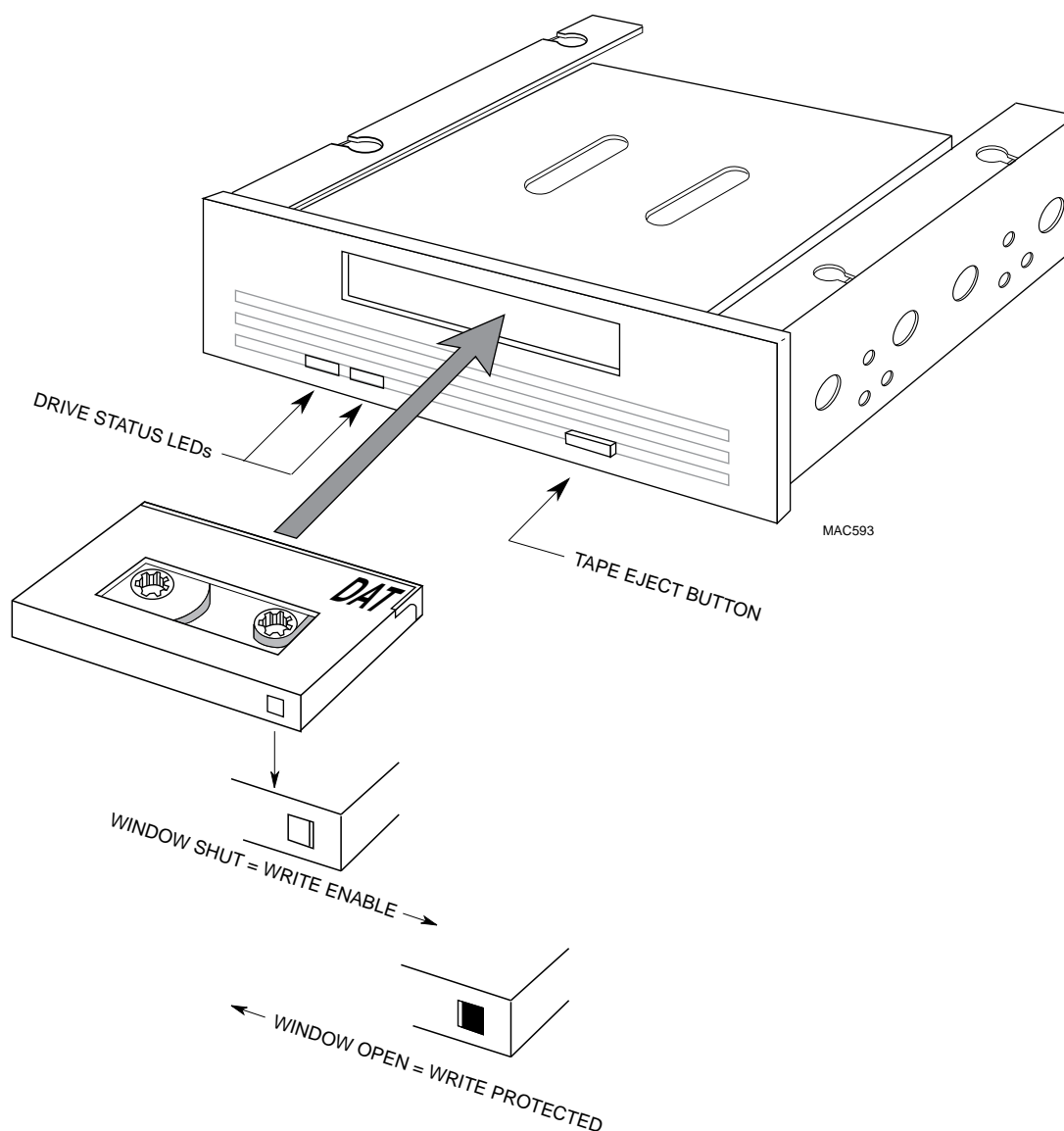
1. Press the button on the drive's front panel to open the tape drive door.
2. Hold the cartridge with the metal side down. The end of the tape cartridge with the write-protect switch will enter the drive first.
3. Insert the cartridge into the drive. Keep pushing until the cartridge stops, and then close the door. After the door closes, the drive positions the tape, after which it is ready for use.

Before unloading the tape cartridge, be sure the tape activity light is out. To unload, press the tape door release button and remove the tape from the drive.

USING A DAT DRIVE

The DAT drive is very simple to use:

1. In order to save data to the tape, the window on the tape cartridge must be in the write enable position. The figure below shows the tape window in both "write enable" and "write protected" positions.
2. The tape inserts as shown below. As you insert the tape through the tape door, the DAT drive takes over the load operation by mechanically pulling the tape cartridge into the load position, just like your home VCR.



DAT Tape Drive.

3. Once the tape is loaded, the status lights on the drive will indicate the status of both drive and cartridge. See the manual that came with your tape drive for information on interpreting the status lights.
4. To unload the tape cartridge from the DAT drive, press the tape eject button, which is shown above. The drive will automatically eject the tape.

For information on maintaining the DAT drive, see Chapter 6.

CHAPTER 4

WHERE DO I GO FROM HERE?

Your Alpha Micro computer is extremely versatile—it can do so many different things that, at this point, you might be somewhat undecided as to where to start.

Your next step is to learn something about the software you can run on your computer. This chapter deals with some of the questions you may be asking:

- What software is available for Alpha Micro computers?
- What Alpha Micro documents should I read next?

INTRODUCTION TO AMOS SOFTWARE

This section will give you an idea of some of the software available for your computer.

The Operating System, AMOS

AMOS, the Alpha Micro Operating System, supervises all of the programs that run on your computer. Regular updates to the AMOS operating system and its accompanying system software are available from your VAR.

Programming Languages

The AlphaBASIC programming language is a standard part of the software for your computer. AlphaBASIC is an enhanced version of BASIC, and contains many business oriented features not found in standard BASICs, such as mapped variables which allow sophisticated record definition, automatic string/numeric mode conversion, and easy to use random and sequential file handling. AlphaBASIC also provides an ISAM (Indexed Sequential Access Method) interface. AlphaBASIC Plus, which is available with some versions of AMOS, contains even more features such as sophisticated data structures and program control constructs.

Please see your VAR for information on other programming languages available for your computer, such as AcuCOBOL-85, AlphaFORTRAN 77, and AlphaC.

Text Preparation

If you are going to be creating documents on your computer, you will be interested in the word processing programs available. AlphaVUE, a screen-oriented text editor, allows you to use your terminal to create and change documents. You see the text of your letter or report on the terminal screen as you enter it on the keyboard. With AlphaVUE, you can move quickly through the document, correcting and adding words, inserting or deleting lines, moving paragraphs, and so on.

The TXTFMT program processes the documents you create using AlphaVUE, and automatically formats them according to your commands. TXTFMT provides features such as right margin justification, page numbering and titling, automatic list creation, and automatic index and table of contents creation.

Also, see the section on "Office Information Products" below for information on the AlphaWRITE word processing package.

Utility Programs

The standard AMOS release contains over 150 utility programs and device drivers. In addition, because of the unique way AMOS handles commands, you can easily create your own utility programs.

Some of the standard utility programs allow you to do such functions as: copy, rename, and erase files; sort the data inside files; use a task management system to schedule and perform background tasks that run without operator control; print files while you perform other tasks at the same time; use the ISAM system to organize and retrieve information quickly; and back up data automatically at a convenient time when nobody is using the computer (in the middle of the night, for example).

Application Programs

Your local Alpha Micro VAR has a variety of programs available for your computer, many of which are aimed at specific business needs such as: general accounting, dental office, legal office, real estate management, manufacturing inventory control, educational learning systems, restaurant management, medical office billing, laboratory analysis, and many others. Please see your VAR for details.

Office Information Products

Several office information products are available separately from your local Alpha Micro VAR. The office information products series includes:

- [∞]AlphaCALC, an electronic spreadsheet program that prepares "what if" financial models quickly and easily.
- [∞]AlphaWRITE, a sophisticated word processing package that provides spelling checking, hyphenation, form letter preparation, automatic outlining and much more.
- [∞]AlphaNET is a low-cost way to transfer files, exchange information, and share resources between different Alpha Micro computers.
- [∞]AlphaTCP allow your system to transfer files, exchange information, and share resources between different computers on the Internet. This package also will provide Telnet services and network printer services.
- [∞]AlphaMAIL is an electronic mail system for sending and receiving messages and reminders among multiple users.
- [∞]MULTI is a window-based environment manager, letting you use multiple programs on one terminal at the same time, and providing a number of desk accessory features, including a phone list, alarm clock, notepad and others.
- [∞]VersiCOMM is a versatile, general purpose communications system, capable of performing a broad range of communication services.
- [∞]VP Search will allow you to search for files containing a key word or series of words. If you can't remember the name assigned to a file or its location, all you need to know is one key word and VP Search will find it.

See your VAR for more information on these and other Alpha Micro office information products.

ADDITIONAL DOCUMENTATION

Now that your computer is up and running, you are ready to start exploring the world of Alpha Micro. Your guide to the new territory is the Alpha Micro software documentation. This section gives you an idea of which documentation to consult for directions depending on the path you want to take.

Your computer is a member of the AMOS family of Alpha Micro computers, and the software documentation that applies to other AMOS based computers applies to yours, too.

You may purchase any book mentioned in this chapter separately; in addition, a multi-volume software documentation library is available containing all the AMOS

software books listed below. You can order any of these books by calling your VAR.

Here's an idea of what to look at next:

"I Want to Start at the Beginning"

If you have never used a computer before, we recommend you read the *AMOS User's Guide*. This book is a practical introduction to the Alpha Micro computer, containing instructions for many of the procedures you'll use every day. It expands on many of the topics discussed in Chapter 3.

"I Want to Learn How to Maintain My Computer"

If you are going to be responsible for making data backups, adding new terminals or printers to the computer, running disk diagnostics, and otherwise managing and maintaining the computer, we highly recommend you read the *System Operator's Guide*, and obtain a copy of the *System Commands Reference Manual*.

The first book explains how to perform the maintenance and diagnostic procedures required by the Alpha Micro system software. The second book will prove an invaluable reference tool—it contains short reference sheets on over 200 AMOS programs.

"I Want to Do Text Processing"

If you want to use your computer to prepare documents, there are several books you should look at:

The *AlphaVUE User's Manual* for information on the AlphaVUE screen-oriented text editor; the *TXTFMT User's Manual* for information on the TXTFMT text formatting program; and the *AlphaVUE/TXTFMT Training Guide*, a tutorial on document preparation for the computer novice.



Although AlphaVUE and TXTFMT are the text processing programs included with the standard AMOS software, you may want to investigate the other word processing packages your VAR has available for your computer, such as AlphaWRITE.

"I Want to Write Computer Programs"

If you have programmed in BASIC before, and want to learn how to use the AlphaBASIC programming language, refer to the *AlphaBASIC User's Manual*. For AMOS releases 2.1 or later, you may also want to see the *AlphaBASIC Plus User's Manual* for information on the enhanced AlphaBASIC Plus programming language.

If you are an experienced assembly language programmer who wants to write machine language programs for your Alpha Micro computer, we recommend you read these books:

- *Alpha Micro Instruction Set*, which contains information on the assembly language instruction set used by the Alpha Micro computers.
- *AMOS Assembly Language Programmer's Manual* which contains information on the assembler, linkage editor, object file librarian, and global cross reference program used by the assembly language programmer.
- *AMOS Monitor Calls* which contains information on the interfaces to the AMOS operating system available to the assembly language programmer.
- *AlphaFIX User's Manual* which contains information on the screen oriented debugger program, AlphaFIX.

CHAPTER 5

SYSTEM ADMINISTRATION

"System Operator" is the title we give the person whose job it is to make sure the computer runs efficiently, and who has access to the files and programs that comprise the system software.

AMOS provides many program tools to support system administration functions. This chapter covers many of these procedures, including:

- "Backing up your data.
- "Allocating disk accounts.
- "Modifying the system initialization file to add jobs and terminals, change memory allocations, and define parallel ports.
- "Defining logical devices.
- "Disk diagnostic procedures.
- "Formatting and initializing diskettes.

BACKING UP YOUR DATA

Once you begin using the computer, you will soon find yourself operating it with confidence and ease. However, no matter how smoothly everything goes, please remember one important thing— you must keep current copies of the data you are working on! This copy is your "backup."

Computers and data storage devices are very reliable, but nobody can guard against an unforeseen occurrence like a power outage, spilled cup of coffee, fire, or hardware malfunction. Such disaster can happen to anyone.

Your data is probably one of your most valuable possessions. How long would it take to re-enter the entire company payroll, all of your accounts receivable invoices, or your research journal article if they were lost? And, what if you could not reconstruct the information no matter how much time you had?

All Alpha Micro computers come with some type of data backup device. Whether your backup device is a diskette drive or streaming tape drive, learn to use it! Develop regular backup procedures and follow them! If disaster strikes, you'll be glad you had a little foresight.

You should back up some or all of the data on your computer at regular intervals. How often you need to back up depends on how often you add or change data. If you add important data every day, you should back up your computer each night. If the data changes only once a week, back up once a week, etc.

As mentioned in Chapter 2, you should be especially sure to make at least one copy of your System Disk onto a medium that will let you boot your computer if, for some reason, you cannot boot from your hard disk. Keep this "warm boot" media in a safe place in case you need it.

You can use the WRMGEN program to create a warm boot tape. For more information on warm boot monitors, see the *System Operator's Guide*.

Because both backup and diagnostic procedures—discussed below—usually must be done when only one job is accessing the disks, it is wise to run them when other users are off the computer (for example, at night or on weekends). By using the Task Manager or the SLEEP command within a command file, you can run backups and tests in the middle of the night when they won't interfere with other users. See the *Task Manager User's Manual* for details on how to do this.

DISK ACCOUNTS

Theoretically, you could store your files on the disk without any type of organization. A list of all the files—the system software, your special application programs, memos, everything—might be several pages long and would be a nightmare to decipher.

As discussed in Chapter 3, a better technique to organize your files is to create "accounts" in which to store as many files as you want. An account is just an arbitrary designation for a group of files. Your system software is already organized into various accounts, and you can add as many or as few additional ones as you need. The following paragraphs describe how to add accounts to your computer.

Passwords

You can assign a password to any account, if you wish. The password acts as a mild security measure to prevent a casual user from accidentally logging into the wrong account. Passwords do not prevent files from being copied into or out of an account, and can be easily changed or erased using the SYSACT command described below.

Organizing the Disk

Because there is the danger of logging into the wrong account if you have accounts with the same account numbers on different disks, you may want to establish a numbering scheme to prevent duplicates. You may want to reserve accounts [1,*] through [77,*] for DSK0:, accounts [101,0] through [200,376] for DSK1:, and so on.



If you find assigning and remembering account numbers cumbersome, you can substitute a predefined "ersatz" name for the account number. One of the files in your system software is called ERSATZ.INI. It's located on DSK0: in account [1,4], and contains several predefined ersatz names, but you can add more of your own, if you wish. For example, one of the predefined ersatz account names is OPR: for DSK0:[1,2]. So whenever you need to log in the account DSK0:[1,2], you can type **LOG OPR:** instead. The *AMOS User's Guide* contains more information on ersatz names and how you can use them.

Adding New Accounts

There is no specific number of accounts you must have; you can add as many as you wish, as long as there is room on the disk. When your computer is brand new, the only accounts are the ones the system software is stored in. You'll want to add more accounts from time to time as your business grows. To do so, use the SYSACT command, following these steps:

1. If you want to see a list of the disk devices on your computer, type **SYSTAT** . The end of the display lists the available disk devices. Decide what device you want to add the accounts to.

2. Log into account [1,2] on any disk device (for example, DSK0:). Type:

```
LOG DSK0:[1,2] 
```

If you weren't already logged into another account, and your version of AMOS makes use of user names, you'll need to enter your user name after the LOG command. If there's a password for this account, you'll be asked for it, too.

3. Type **SYSACT** followed by the name of the device you want to add the accounts to and press . For example:

```
SYSACT DSK1: 
```

4. SYSACT responds with its prompt symbol, an asterisk. If you'd like to see a list of all the things SYSACT can do, type:

```
*H 
```

5. From the list you see next, you can select different functions to perform. You want to add a new account, so type **A** and the account number you want to add and press . For example:

*A 100,5 RETURN

6. [∞]SYSACT responds:

Password:

SYSACT asks if you want to protect the new account with a password. You can enter a password of up to six characters, or you can just press the RETURN key if you don't want to assign a password. If you do enter a password, whenever other users try to log into that account, they have to type the password. If they don't know the password, they aren't allowed to log in.

7. [∞]You can see a list of all the account numbers on the disk device and their passwords by selecting the L (List) function like this:

*L RETURN

8. [∞]When you are finished using the SYSACT command and are ready to return to AMOS command level, select the E (end) option:

*E RETURN

SYSACT returns you to AMOS command level and the AMOS prompt symbol appears on your screen.

For complete information on using the SYSACT command, see the SYSACT reference sheet in the *System Commands Reference Manual*.

MODIFYING THE SYSTEM INITIALIZATION FILE

The name of the system initialization file for your computer is AMOS32.INI. This special file in account DSK0:[1,4] defines to the AMOS operating system all of the devices connected to your computer, the jobs that will run on the computer, and special programs which need to be loaded into memory. As requirements change or as devices are added on to your computer, you must modify the system initialization file.

A very simple sample system initialization file is shown below. You will become more familiar with it as you read the discussion following it. Depending on your model of computer, your system initialization command file may look slightly different.



Do not change any lines in the system initialization file other than those discussed here until you're familiar with the documentation on the file in the *System Operator's Guide*.

```
:T
;
JOBS 5
;
JOBALC JOB1
;
QUEUE 2000
;
TRMDEF TERM1,AM318=0:19200,ALPHA,200,200,200,EDITOR=15
;
PARITY                ; Clear memory
VER                   ; Unlock keyboard
;
SCZDSP SCZRR.SYS      ; PIC-encoded SCSI dispatcher
;
DEVTBL DSK1,DSK2,DSK3,DSK4,DSK5
DEVTBL TRM,RES,MEM
DEVTBL /STR0          ; Streaming tape device
DEVTBL /EPP0,EPP1     ; Eagle 300-500 Parallel printer ports
;
BITMAP DSK                ; Paged bitmaps for AMOS 2.X
;
ERSATZ ERSATZ.NEW
MSGINI 20K
;
SYSTEM SYMSG.USA
SYSTEM DCACHE.SYS/N/M/U 300K      ; Enable disk read-caching
SYSTEM DVR:DSK/N 100K 60         ; Enable disk write-caching
SYSTEM CMDLIN.SYS
SYSTEM SCNWLD.SYS
SYSTEM QFLOCK.SYS
SYSTEM TRM.DVR[1,6]
SYSTEM STR.DVR[1,6]
SYSTEM EPP.DVR[1,6]
SYSTEM
;
SET DSKERR
;
MOUNT DSK1:
MOUNT DSK2:
MOUNT DSK3:
MOUNT DSK4:
MOUNT DSK5:
;
MEMORY 0
```

Simple Initialization File

Defining Eagle 100 Parallel Ports

Eagle 100 and 200 computers contain one standard speed parallel port, which is not automatically defined for you. If you want to use the parallel ports, you will need to add the following DEVTBL statement:

```
DEVTBL /EGP0
```

You will also need to load the parallel printer driver into system memory using a SYSTEM statement:

```
SYSTEM EGP.DVR[1,6]
```

Then, if you want to connect a printer to the parallel port, change the DEVICE statement in the printer initialization file to reference parallel port 0 (EGP0:). For example:

```
DEVICE=EGP0:
```

For information on printer initialization files and printer spoolers, see the *System Operator's Guide* for your version of AMOS. For information on constructing cables to connect a printer to a parallel port, see Appendix A.

Defining Eagle 300-500 Parallel Ports

Eagle 300-500 computers contain two high speed parallel ports, which are not automatically defined for you. If you want to use the parallel ports, you will need to add the following DEVTBL statement:

```
DEVTBL /EPP0,EPP1
```

You will also need to load the parallel printer driver into system memory using a SYSTEM statement:

```
SYSTEM EPP.DVR[1,6]
```

Then, if you want to connect a printer to the parallel port, change the DEVICE statement in the printer initialization file to reference parallel port 0 (EPP0:). For example:

```
DEVICE=EPP0:
```

For information on printer initialization files and printer spoolers, see the *System Operator's Guide* for your version of AMOS. For information on constructing cables to connect a printer to a parallel port, see Appendix A.

Defining Eagle 550 Parallel Ports

Eagle 550 computers contain four high speed parallel ports, which are not automatically defined for you. If you want to use the parallel ports, you will need to add the following DEVTBL statement:

```
DEVTBL /SEP0,SEP1,SEP2,SEP3
```

You will also need to load the parallel printer driver into system memory using a SYSTEM statement:

```
SYSTEM SEP.DVR[1,6]
```

Then, if you want to connect a printer to the parallel port, change the DEVICE statement in the printer initialization file to reference parallel port 0 (SEP0:). For example:

```
DEVICE=SEP0:
```

For information on printer initialization files and printer spoolers, see the *System Operator's Guide* for your version of AMOS. For information on constructing cables to connect a printer to a parallel port, see Appendix A.

Adding Jobs

When you increase the number of terminals connected to your computer, you also need to modify the system initialization file so the system software knows what ports they are connected to and what jobs they are attached to.



The steps below are necessary when you add an additional terminal to your computer. However, one terminal and job are already defined and set up for you, and these steps are not necessary for that first terminal.

1. To add jobs to your system, log into DSK0:[1,4] and make a copy of your system initialization file. For example, if your system initialization file is named AMOS32.INI:

```
COPY TEST.INI=AMOS32.INI RETURN
```

2. Use the AlphaVUE text editor to look at the TEST.INI file:

```
VUE TEST.INI RETURN
```

3. At the beginning of the TEST.INI file is a JOBS statement. The number following the JOBS statement represents the total number of jobs on your computer.

If your computer has five jobs now and you want to add two more jobs, change the number in the JOBS statement to 7 or more. For example:

```
JOBS 7
```

4. On the lines following the JOBS statement, there are one or more JOBALC statements. You can define each job in a separate JOBALC statement, or you can define several jobs in the same JOBALC statement by separating the jobnames with commas. For example:

```
JOBALC JOB4, JOB5
```

Each jobname—which can have up to six characters—defines a job on your computer. The total number of jobs defined in the JOBALC statements must be equal to or less than the number in the JOBS statement above.

5. You also need to define the terminals you're going to attach to these jobs. The TRMDEF statement defines the terminal characteristics and tells the computer which port on the back panel it's connected to. Add any new TRMDEF statements after the last TRMDEF statement in the file.

Here is a sample TRMDEF statement:

```
TRMDEF TERM2, AM318=1:19200, ALPHA, 200, 200, 200, EDITOR=10
```

Using the sample, here's the information you must tell AMOS about a terminal:

- TERM2 is the terminal name. You may use any name containing six or fewer letters and/or numbers. Each terminal must have a different name.
- AM318 is the name of the interface driver for the circuit board the terminal is connected to. There is a corresponding software driver file in the DVR: account called AM318.IDV.
- 1 is the octal number of the port the terminal is attached to.
- 19200 is the baud rate of the terminal.
- ALPHA is the name of the terminal driver. ALPHA can be used for most Alpha Micro terminals, but you may want to see if a more specific driver is available for your terminal.
- 200,200,200 are buffer sizes, expressed in number of characters. Different situations may require other buffer sizes, but for now just use 200,200,200.
- EDITOR=15 enables the line editor for this terminal. See the *AMOS User's Guide* for more information on the line editor.

For a more extensive explanation of what each of these items represents, see the *System Operator's Guide to System Initialization*.

6. Now you can use the ATTACH statement to link the terminal defined in the TRMDEF statement with the job defined in the JOBALC statement. (Or, you can use the SETJOB statement instead of ATTACH; see the *System Operator's Guide to System Initialization* for information on SETJOB). Add the ATTACH statement anywhere after the last SYSTEM command in the file.

```
ATTACH TERM2 ,JOB4
```

Immediately after the ATTACH statement you need to include several statements to initialize the job.

7. The KILL statement forces a Control-C to the job and makes it ready to receive and process commands.

```
KILL JOB4
```

8. The FORCE statement forces the new job to perform other commands, such as the MEMORY command. To allocate 256K of memory to the new job, type:

```
FORCE JOB4 MEMORY 256K
```

9. If you have a specific disk account you want the new job to log into each time the computer boots, you can do that too. To log the job into DSK1:[100,1], type:

```
FORCE JOB4 LOG DSK1:[100,1]
```

10. To unlock the terminal's keyboard, type:

```
FORCE JOB4 VER
```

11. And finally, add a WAIT command to give the computer time for the new job to process the above commands before proceeding with the rest of the instructions in this TEST.INI file.

```
WAIT JOB4
```

12. When you have added the statements described above for each job you're adding to the computer, you're ready to perform a test reboot. Warn everyone using the computer that you're going to reboot, and when they're ready, press the ESC key to move to AlphaVUE command level, type G RETURN. The computer then uses your TEST.INI file to reboot.

If everything goes all right, and the new terminals and jobs work to your satisfaction, you can rename the TEST.INI file to the proper name for your system initialization file:

```
COPY AMOS32.INI=TEST.INI RETURN
```

If there was something wrong with the changes you made, do not rename the TEST.INI file. Press the reset button to reboot the computer with the original system initialization file. Now you can use AlphaVUE to correct the TEST.INI file and try again.

Changing User Memory

How much of the computer's total supply of memory is assigned to each job is determined by the MEMORY command. If you or the System Operator of your computer decide to add jobs or alter memory allocations, you should first refer to the *System Operator's Guide*.

To see a display of the current memory allocations on your computer, use the SYSTAT command:

```
SYSTAT/NRETURN
```

In addition to many other pieces of information about the status of the computer, SYSTAT shows how much memory is assigned to each job. The SYSTAT command is explained in detail in the *System Commands Reference Manual*.

If you decide to change the amount of memory allocated to a job, you can modify the system initialization file following the instructions below.



NEVER change the system initialization file directly! Always make a copy of it and modify the copy, as described below.

Briefly, here is a summary of what you need to do:

1. Log into DSK0:[1,4] and make a copy of the system initialization file:

```
COPY TEST.INI=AMOS32.INIRETURN
```

2. Use the AlphaVUE text editor to see the contents of the test file:

```
VUE TEST.INIRETURN
```

If you are unfamiliar with AlphaVUE, refer to the *AlphaVUE User's Manual*.

3. Scan through the file until you come to the ATTACH statement that attaches the terminal to the job whose memory you want to change. Following the ATTACH statement are several other statements, among which is the MEMORY statement.

The number after the MEMORY statement is the amount of memory currently allocated to the job. You can increase this number or decrease it as long as you keep in mind how much total memory your computer has, and how much memory the other jobs need.

4. The last statement in the system initialization file is `MEMORY 0`. This statement allocates to the System Operator's job all the memory not specifically assigned to other jobs.

If you want to increase the amount of memory assigned to the job attached to the operator terminal—the terminal the computer boots on, connected to Port #0—all you need to do is subtract memory from some other job.

5. When you've changed the `MEMORY` statements, you need to reboot the computer to put them into effect. When everyone who might be using the computer is either logged off or at AMOS command level, press the `ESC` key to get to AlphaVUE command level, type `G`; the computer automatically reboots using the `TEST.INI` file.
6. After the computer finishes booting, use the `SYSTAT` command to see how much memory is assigned to each job on the computer. If it meets with your approval, log back into `DSK0:[1,4]` and rename the `TEST.INI` to the correct name for your system initialization file. For example:

```
RENAME/D AMOS32.INI=TEST.INI
```

Be careful not to rename your `TEST.INI` file too soon. You might want to let the computer run awhile to test out the new memory allocations before you rename it. Then, if you decide you don't want to keep the new memory allocations, you can always press the reset button to reboot with your former system initialization file.

ANALYZING THE DISK

A disk diagnostic program reads data from a disk. If it cannot read an area of the disk, it reports the problem to you. Checking your disk frequently with disk diagnostic programs helps prevent data loss—the sooner you catch a malfunction, the less data is likely to be affected.

The type of problem found by disk diagnostics is known as a "hard error," because it means data is lost. A "soft error" means the computer had trouble reading the data, but data was not lost. Disk diagnostics do not report soft errors.

If a diagnostic program indicates problems, you may need to restore data from a backup copy or reconstruct the data on a damaged disk. If you have this type of problem, consult the section "Recovering From Disk Errors" in the *System Operator's Guide*.

Before running any of the disk diagnostic tests, especially if you suspect a problem, it is a good idea to use the `SET DSKERR` command:

```
SET DSKERR
```

SET DSKERR causes the computer to report the location of any hard errors the diagnostic program finds. If you don't use SET DSKERR, the diagnostic tells you only that an error occurred, not where on the disk it happened. You must run the diagnostic program from the same job where you used SET DSKERR.

The next two sections discuss two very useful diagnostic programs, REDALL and DSKANA. You can find more information on disk diagnostic programs in the *System Operator's Guide* and the *AMOS User's Guide*.

The REDALL Command

REDALL reads every block of data—or the number of blocks you choose—on the disk you specify, and reports any hard errors. It does not alter the data on your disk.

REDALL works on both hard disks and diskettes. It is a good idea to run REDALL for each disk on your computer occasionally, possibly once a week. That way, if any disk problems develop, you can be sure of detecting them quickly.

To use REDALL, perform these steps:

1. To read all the blocks on a disk, enter REDALL followed by the device name of the disk you want to read. For example:

```
REDALL DSK2: 
```

2. If you don't want REDALL to read all blocks on the disk, follow the disk specification with the number of blocks you want read:

```
REDALL DSK2:100 
```

Do not put a space between the device specification and the number of blocks. The command above tells REDALL to read the first 100 blocks on DSK2:.

3. REDALL now tells you the number of blocks it is reading. For example:

```
REDALL DSK2:   
Reading 13800 blocks  
EXIT
```

4. REDALL ends when it finishes reading the blocks. If any errors occur, REDALL displays the appropriate error message on your screen.

The DSKANA Command

The DSKANA command is an important part of your disk maintenance routine. DSKANA analyzes the data on a specified disk and reports lost and mis-linked disk blocks, inconsistent block counts, and other file errors.

Each file on the disk is stored in one or more disk blocks. AMOS keeps track of which disk blocks are currently used in files and which are not by means of a special structure called a "bitmap." Each disk has its own bitmap.

DSKANA compares the information in the bitmap with the actual data on the disk to make sure the bitmap is accurate. For example, if DSKANA finds a disk block that is part of a file, but the bitmap shows the block not in use, DSKANA reports an error. When DSKANA finishes analyzing the disk, it rewrites the bitmap unless you tell it not to.

Use DSKANA frequently on all of your disks. It is a good practice to use DSKANA on every disk just before you back up the files on that disk.

For more information on DSKANA, see the *System Commands Reference Manual*.



NEVER use DSKANA (unless you are using the /C option described below) while other users are accessing the specified disk; doing so may damage the bitmap and the files on the disk.

To use DSKANA, follow these steps:

1. Log into OPR: by typing:

```
LOG OPR: 
```

2. Type **DSKANA** followed by the device name of the disk you want to analyze and press . For example, to analyze DSK1:, type:

```
DSKANA DSK1: 
```

3. You now see:

```
[Begin analysis of DSK1:]
```

As DSKANA checks the disk, it displays the disk account numbers and, when it finishes, it displays the results of its analysis. For example:

```

DSKANA DSK1: RETURN
[Begin analysis of DSK1:]
[1,2]
.
[100,20]
[The following blocks were marked in use but not in a file]
1767    1772    2562    3456    6265

[The following blocks were in a file but not marked in use]

[Rewriting BITMAP]

No file errors

```

If you see the "No file errors" message, the file structure on the disk is intact. If DSKANA lists a number of file errors, there is a problem with the disk's file structure. Your next step is to run DSKANA again, using either the /L or /E option—discussed below—to see where the errors are on the disk.

For the complete procedure to follow if DSKANA finds any file errors, see "Recovering From Disk Errors" in the *System Operator's Guide*.

DSKANA Options

DSKANA has several options, allowing you to select exactly what information you want to see. Your choices are:

| OPTION FUNCTION | |
|-----------------|---|
| None | Displays account numbers on disk and summary only. |
| /C | Same information as default, but does not rewrite bitmap. |
| /E | Lists files and blocks in which any errors occur. |
| /L | Lists all files and blocks on the disk. |

To use one of these options, place it after the DSKANA command like this:

```
DSKANA DSK1: /C RETURN
```

As mentioned above, you need to use the /L or /E option to find the location of any file errors DSKANA detects. The /C option is discussed in the next section.

To see the list of DSKANA options, type **DSKANA** RETURN without specifying a device name.

The CHECK Option and Automatic Backups

At times, you may want to have DSKANA examine a disk without re-writing the bitmap, especially when using an "automatic" backup method such as a command file or the Task Manager to perform the backup.

The reason for this is simple: assume you run DSKANA at night as part of an automatic backup procedure. If anyone on your computer leaves a file—such as an AlphaVUE or AlphaWRITE document—open on the device DSKANA is checking, DSKANA doesn't take the open file into account when it rewrites the bitmap for the device. When the person returns in the morning and writes the file to the disk, it causes a bitmap error, because the computer didn't know the file was open. This could corrupt the disk, causing you to lose data.

To run DSKANA without rewriting the bitmap, use the /C option switch. You see DSKANA's normal display when you use the /C option, except for the [Rewriting BITMAP] message.

FORMATTING AND INITIALIZING A DISKETTE

Before you use a new diskette for the first time, you must format it. Formatting configures the diskette so it is ready to receive and hold data in the pattern your computer uses. Then you must initialize the diskette, which sets up its initial account structure.

Follow the steps below to format and initialize a diskette.



These steps erase any data already on a diskette! Make sure the diskette is empty or does not contain files you need before you format it. You can use the command **DIR Devn:** [] **RETURN**, where **Devn:** is the device name of the diskette drive, to see if there are files on the diskette.

1. [∞]Use the LOG command to log into the System Operator account [1,2] on DSK0:.
Type:

```
LOG OPR: RETURN
```

```
Logged into OPR:
```

If you weren't already logged in, and your computer makes use of user names, enter your user name when the prompt for it displays.

2. [∞]Insert the diskette into the drive as described in Chapter 3. Don't use the MOUNT command. Instead, enter:

```
FMT219 Devn: RETURN
```

where Devn: is the name of your diskette drive—probably FLP0: or MIN0:. (Chapter 3 discusses device naming conventions.) You now see the message:

BEGIN FORMATTING

When it is finished, FMT219 displays:

EXIT

The diskette is now formatted. Before you can use the diskette, you need to initialize it.

3. Now, use the SYSACT command to initialize the diskette. Type:

SYSACT Devn:

4. You now see the SYSACT prompt symbol, an asterisk. Type **I** (the SYSACT Initialize command):

*** I**

SYSACT now asks you to confirm this command:

Initializing the disk clears all files -
enter Y to confirm:



Initializing the diskette erases any data on it, so be sure the correct diskette is in the drive and *you entered the correct device name* before you answer.

Type **Y** . Now SYSACT asks you:

On AMOS 1.x operating systems you'll see this query:

Reserve space for how many accounts?

The default is 64 accounts, which is probably more than enough. Press the key to accept this number.

On AMOS 2.x operating systems you'll see this query:

Create extended directory structure? [NO]

This option is normally used with hard disk drives where the standard logical size can be increased beyond the 32MB limit. The default response is NO. Press the key to accept the default response.

5. Now, use the E command to leave SYSACT:

*** E**

You have now left SYSACT and are at AMOS command level.

The diskette is now ready to use. To log into the diskette and write data to it, you need to add accounts to the diskette. Use the SYSACT command again and use the A (Add) option as described earlier. For example, to add accounts [100,2] and [120,0] on the diskette in device FLP0:, type the following commands:

```
SYSACT FLP0:   
*A 100,2   
Password:   
*A 120,0   
Password: MINE   
*E 
```

In this example, one of the new accounts, [100,2], is not protected by a password, and the other, [120,0], is protected by the password MINE.

For more information on FMT219, LOG, and SYSACT, refer to the *System Commands Reference Manual*. For more information on disk accounts, see the *AMOS User's Guide*.

There is a buffered I/O option that increases file transfer speed on diskette drives. For more information on this feature, refer to the *System Commands Reference Manual*.

CHAPTER 6

PREVENTIVE MAINTENANCE

Your computer requires little care. However, preventive maintenance is an integral part of keeping any computer running at peak efficiency. To safeguard your investment, we recommend you establish a regular maintenance schedule for your equipment.

This chapter contains some recommended maintenance procedures for:

- Diskettes, DAT, and streamer tape cartridges.
- The diskette drive, as well as DAT and streaming tape drives.
- The main enclosure.

DISKETTES

In order to protect your data, diskette must be handled and cared for properly.

Here are some hints to remember:

1. The recording surface for diskettes is contained within a protective enclosure—never try to remove this enclosure or touch the recording media within.
2. Treat diskettes gently. Fingerprints, scratches, spills, and dirt can ruin them.
3. Keep your diskettes stored in a dust-free environment. This helps them stay clean.
4. Never expose diskettes to an electromagnetic field—doing so could cause your data to disappear! For example, do not leave diskettes on top of the computer or terminal since various items within the enclosure emit a strong magnetic field.
5. Avoid temperature extremes. Do not expose diskettes to temperatures below 50 degrees Fahrenheit (10 degrees Celsius) or above 125 degrees Fahrenheit (52 degrees Celsius). Do Not leave your diskettes next to a window where radiant heat from direct sunlight can cook them.

Diskettes should be at about the same temperature as your computer or spurious device errors could result. So, if the place you store the media has a very different temperature than the area where your computer lives, place the diskette near the computer and give it a few minutes to adjust to the new temperature before use.

CARE OF STREAMING TAPE AND DAT CARTRIDGES

A cartridge tape can store data from an entire disk, so it is worth taking care of properly. In addition to the tips for diskettes, above, remember the following:

- Store cartridges with the write protect in the SAFE position.
- Keep magnets away from your tapes. Even weak magnets such as those in paper clip holders can erase data on a cartridge tape.
- Don't expose tapes to very high or low humidity (more than 80% or less than 20%).
- Cartridge tapes should be acclimated to computer-room temperature and humidity conditions before use. If the tape has been stored away from the computer, it should be returned to the computer environment at least eight hours before use. (If it has been in a different environment for less than eight hours, it should be kept in the computer location for at least as many hours as it was away from it).

DISKETTE DRIVE

The diskette drive requires periodic cleaning of its read/write heads. A regular cleaning schedule can prevent problems, such as data loss, which can result from dirty heads. If you do start noticing data loss with either of these two devices, cleaning the heads will probably take care of it.

You can clean diskette drives using a special head-cleaning kit available from vendors of computer supplies.

1/4" STREAMING TAPE DRIVE CLEANING

It is very important to clean the read/write head of your tape drive periodically. If you use your cartridge tape drive to do one or more backups per day, you should clean the head at least once a week. For more frequent use, keep in mind:

- When you use new tapes exclusively or often, clean the head after every two hours of tape drive running time.
- If you reuse tapes most of the time, clean the head after every eight hours of running time.

For the AM-625, AM-626, and AM-627 streaming tape drives, follow these cleaning procedures: The head is a brass-colored metal square that can be seen in the tape slot. Use a line-free cotton swab dipped in isopropyl alcohol (at least 91% strength) to rub the surface of the head. Then rub the head with a dry swab to prevent residue buildup. Do not use 70% rubbing alcohol.

DAT DRIVE CLEANING

If excessive magnetic dust and debris collects on one or more of the heads, magnetic media may become unreadable and unwriteable. This situation may occur infrequently, or not at all, depending on the media used.

Whenever the tape cartridge status light flashes, you should clean the drive heads with a cleaning cartridge.

As routine maintenance, the drive heads should be cleaned after every 50 hours of operation.

To clean the heads on the DAT drive, use a DAT cleaning cartridge designed for your drive. The cleaning cartridge contains the correct recognition holes to allow the DAT drive to recognize that it is a cleaning cartridge.

Follow these general guidelines to use the cleaning cartridge:

1. Insert the cleaning cartridge into the DAT drive. The drive will immediately detect that this is a cleaning cartridge.
2. The drive will load and run the cartridge in about 10 seconds, then it will be ejected.

MAIN ENCLOSURE

The computer main enclosure is sturdy painted sheet metal and plastic. Clean it as you would any other painted surface, using a gentle detergent. Remember, however, that if any liquid makes its way inside the enclosure, severe damage to the computer could result. So, a light dusting is the safest cleaning procedure, and probably all the main enclosure will require.

CHAPTER 7

TROUBLESHOOTING PROCEDURES

We believe you will find your Alpha Micro computer easy to install and use, and be pleased with its exceptional reliability. However, if a problem should occur, look at the list of symptoms below to find practical information on diagnosing and correcting the problem. Some of the problems below are the result of improper installation, while others can occur through user error.

To make troubleshooting your computer as simple as possible, we have defined several procedures to use in tracking down problems. These procedures should either guide you to finding and fixing the problem, or take you to a point where you can verify a major hardware failure or software problem has occurred.

A hardware failure should be handled by your VAR.

A software problem, on the other hand, might be something you can handle yourself. However, we do not give software checkout procedures in the sections below. This is because such procedures require you to be a fairly experienced user of the computer. With experience, you should have no problem in tracking down and fixing such problems. For information on software procedures, refer to the *System Operator's Guide*. For now, we recommend you contact your VAR if you have a software problem you cannot fix easily.

THE SYMPTOMS

Symptom #1: No Display on the Operator Terminal Screen

If you see no characters on the screen at all when you boot the computer, perform the following troubleshooting procedures in the order given:

| | |
|-----------------------------------|----------------|
| [∞] Check Power/Run/Memory Lights | (Procedure #1) |
| [∞] Check the System Status Codes | (Procedure #2) |
| [∞] Powerup/Reset | (Procedure #3) |
| [∞] Check Terminal/Printer | (Procedure #4) |
| [∞] Self Test | (Procedure #5) |
| [∞] Alternate Boot | (Procedure #6) |

Symptom #2: Scrambled Characters on the Terminal Screen

If the characters you see on the screen after you boot are not legible text, perform the procedures listed below in the order given:

| | |
|-----------------------------------|----------------|
| [∞] Check Power/Run/Memory Lights | (Procedure #1) |
| [∞] Check the System Status Codes | (Procedure #2) |
| [∞] Check Terminal/Printer | (Procedure #4) |
| [∞] Powerup/Reset | (Procedure #3) |
| [∞] Self Test | (Procedure #5) |
| [∞] Alternate Boot | (Procedure #6) |

Symptom #3: Computer Does Not Finish Booting

The operator terminal displays the system initialization command file as the computer boots. The last command in the .INI file is MEMORY 0. If the terminal display stops before reaching MEMORY 0, and more than a minute or so goes by, the computer did not finish booting. Perform these procedures in the order given:

| | |
|-----------------------------------|----------------|
| [∞] Check Power/Run/Memory Lights | (Procedure #1) |
| [∞] Check the System Status Codes | (Procedure #2) |
| [∞] Powerup/Reset | (Procedure #3) |
| [∞] Self Test | (Procedure #5) |
| [∞] Alternate Boot | (Procedure #6) |

Symptom #4: Job on Computer Locks Up After Bootup

If, after the computer has finished booting, the computer does not respond to your commands, we say it has "locked up" or "crashed." Perform these procedures in the order given:

| | |
|-----------------------------------|----------------|
| [∞] Check Power/Run/Memory Lights | (Procedure #1) |
| [∞] Check the System Status Codes | (Procedure #2) |
| [∞] Powerup/Reset | (Procedure #3) |
| [∞] Self Test | (Procedure #5) |
| [∞] Check Terminal/Printer | (Procedure #4) |
| [∞] Alternate Boot | (Procedure #6) |

THE TROUBLESHOOTING PROCEDURES

The following pages define the various troubleshooting procedures listed in the previous section. We assume you are familiar with the placements of various buttons and switches on the computer—such as the reset and power buttons; if not, refer to the illustrations in Chapter 2.

Procedure #1: Check Power/Run/Memory Lights

A. Are the power light and fan on? If yes, go to Step B. If the fan is on but the power light isn't, your power light may be burnt out. Go to Step B.

1. Press the power button to turn the computer off.

Make sure the power cord is not damaged and is the correct type for your geographical area. Make sure it is plugged in firmly on both ends. If there is a problem with the cord, correct it and go to "Procedure #3: Powerup/Reset." If the computer comes up correctly, your problem is fixed.

2. Check the electrical source by plugging something else into the outlet, such as a lamp. If there is a problem with the outlet, correct it and go to "Procedure #3: Powerup/Reset." If the computer comes up correctly, your problem is fixed.

3. Check to make sure your computer is configured for the proper input voltage by checking to see the voltage setting is correct on the voltage switch on the back panel of your computer.

Caution: If you have operated the computer with the improper input voltage, you may have damaged the computer.

If your computer is configured incorrectly, change the voltage switch to the proper setting, and perform "Procedure #3: Powerup/Reset" only ONCE. If the computer does not come up correctly, shut off the power and contact your VAR for help; stop. If it does, your problem is fixed.

If your computer is configured correctly, proceed:

4. If the voltage configuration is correct, and the power cord is OK and in place correctly, but the power light is still not on, call your VAR for help. Stop.

B. OK, the power light is on. Is the run light on? If so, skip to Step C.

1. If the run light is off, then perform "Procedure #2: Check the System Status Codes." If the procedure does not find and correct any problems, proceed.

2. Perform "Procedure #3: Powerup/Reset," ONCE. If that procedure does not correct the problem, proceed.

3. Perform "Procedure #5: Self Test." Call your VAR with the results of your self test and ask for help. Stop.

C. The power light and the run light are both on. Check the front panel display, after booting successfully the status LED will display a 0 and the run light should be on. If a status code appears on the front panel display and the computer does not boot, compare the status code with the status codes shown in Procedure #2.

1. **Note:** If the memory light is on more than once in a great while, contact your VAR—you probably have memory problems.

The memory light is actually a "1" in front of the two-digit status code on the front panel. When you see a 1 in this position, it indicates a parity error condition.

If the memory light is on, perform "Procedure #3: Powerup/Reset" ONCE. If that procedure does not clear the memory light, proceed.

2. Perform "Procedure #5: Self Test." Call your VAR with the results of the self test and ask for help. Stop.

D. No problem was found in this section. Please perform the next procedure on your checklist.

Procedure #2: Check the Computer Status Codes

The section below assumes your computer is not running the self test. For information on the status codes you can see when running the self test, refer to "Procedure #5: Self Test." For more information on the status codes mentioned below, refer to Chapter 8.

Look at the front panel Status Display:

- A. If the LED is displaying a 0, everything is normal. (As the computer boots itself, a series of status codes appears on the display panel in rapid succession. None of the codes should remain on the display longer than a second or two.) No problem was found in this procedure. Return to the current procedure or continue with the next procedure on your checklist.
- B. If Status Code 4 remains on the display panel, this indicates that the computer ran out of QUEUE blocks. Additional QUEUE blocks can be allocated in the system initialization command file.
- C. If Status Code 10, 11, or 12 remain on the display panel, this indicates that during the boot process, the computer was unable to find AM318.IDV in [1,6], or the terminal driver in [1,6], or the system initialization command file in [1,4].
- D. If one of the Status Codes 20, 21, 22, or 2E remains on the display panel, the computer did not boot because of a problem with the boot PROM. Perform "Procedure #6: Alternate Boot." If the computer does not come up correctly, something serious may be wrong. Call your VAR for help. Stop.
- E. If Status Code 25 or 35 remains on the display panel, this indicates that the computer was unable to locate the User File Directory (UFD) in account [1,2] on the boot device. This could indicate a problem with the format on your boot device, contact your VAR for assistance.

- F. If Status Code 23, 2F, 33, or 3F remains on the display panel, you might have a problem with your boot device selection. Verify that the boot ID switches on the back panel of your computer are set correctly according to the instructions in Chapter 2. Perform "Procedure #3: Powerup/Reset." If the computer does not boot normally at this point, call your VAR. Stop.
- G. If Status Code 24 through 28 or 34 through 39 remains on the display panel, your System Disk might be the source of the problem. Perform "Procedure #6: Alternate Boot." If the computer boots correctly, then you can suspect something is wrong with the System Disk. Your VAR can help you restore your System Disk. If the computer does not boot, something more serious may be wrong. In either case, call your VAR for help. Stop.
- H. If you see Status Code 29 on the display panel, the computer is trying to warm boot from a tape device and is searching for a label on the tape. If this status code remains on the display panel for more than a minute or so, verify the correct tape is mounted in the drive. If you have a known good warm boot tape in the drive, and the computer will not boot from it, contact your VAR for help. Stop.
- I. If Status Code 2A, 2b, 3A, or 3b remains on the display panel, your computer is having a problem loading or executing the system monitor program. Perform "Procedure #6: Alternate Boot." If the computer boots correctly, you might have a problem with the files on your System Disk. Your VAR can help you restore these files. If the computer does not boot from the alternate device either, something more serious may be wrong. Again, contact your VAR for help. Stop.
- J. If Status Code 2d or 3d remains on the display panel, your computer has encountered an error, perhaps due to faulty memory or addressing. Perform "Procedure #5: Self Test." If your computer does not pass the self test, call your VAR with the information from the test. Stop.
- K. If the status code is 80 through 8C, you are in the self test mode. Perform "Procedure #3: Powerup/Reset." If the computer boots normally, your problem is fixed; if it doesn't, call your VAR.
- L. If the Status Code is a number not discussed above, your computer is probably a victim of random noise on the power lines or a software error.

Perform "Procedure #5: Self Test." If the computer does not pass the self test, call your VAR with the information from the test.

If the computer passes the self test, perform "Procedure #3: Powerup/Reset"; if the computer comes up normally, your problem is probably fixed. If it does not come up normally, call your VAR.

Procedure #3: Powerup/Reset

- A. If the computer is already turned on, skip to Step B. To turn on the computer, follow the instructions in Chapter 2. Remember—DO NOT hold in the reset button while you turn on the computer or you will enable the self test.

The computer should now boot. Skip down to C, below, for instructions on how to tell if the computer is up.

- B. To reset the computer:

1. Before you reset the computer, make sure everybody is at AMOS command level— they see the AMOS prompt, usually a dot. If you reset while people are working on the computer, they will lose whatever they were in the middle of. If any files are being written or transferred to the disks, wait until that process is finished— if you reset while data is being written to the disk, you might damage the data.



If anyone has files open, and cannot exit the program because his or her terminal is locked up, go ahead and reset the computer. Then, after you are up and running, run DSKANA on the disk where the file resides to check for disk errors. See Chapter 5 for instructions on using DSKANA.

2. Now, push the reset button.

- C. Check to see if the computer is up. If you see the system initialization command file displayed on the operator terminal, and the last command is MEMORY 0, the computer has booted.

To make sure, type the following command:

SYSTAT RETURN

Your terminal should display system status information.

If MEMORY 0 was the last command in the system initialization command file and the SYSTAT command works, the computer booted successfully, and you can return to the procedure you are performing or to the next procedure on your checklist.

- D. If the computer did not boot successfully, try turn the computer off and back on again:

1. If your computer has a diskette drive, remove any diskette in the drive.
2. Turn off the power to any terminals, printers, and other peripheral devices connected to the computer.

3. Turn off the computer and wait a few seconds.
4. Turn on all of the terminals, printers, and peripheral devices connected to the computer.
5. Turn on the computer. Do not hold in the reset button while you do so.
6. Return to Step C, above, to see if the computer is up and running.

Return to the current procedure or go to the next procedure on your checklist whether or not the computer is up and running.

Procedure #4: Check Terminal/Printer

Note: Various steps in the procedure below tell you to reset the computer. If you are not familiar with this procedure, refer to Step B in "Procedure #3: Powerup/Reset."

A. Make sure each terminal is turned on:

1. For video display terminals, do you see anything on the screen? If so, the power is on—skip to B, below.

For printers, is the power light on? If so, the power is on—skip to B, below.

2. See the terminal manufacturer's manual to find out how to troubleshoot power or fuse problems for the device.

Correct the problem and reset the computer. If it comes up normally and your terminals seem to work all right, your problem is fixed.

B. If you do not see anything on the screen, type `CTRL/Q`, then `CTRL/C`. If you see ^C on the screen, your computer is communicating with the terminal. Type:

`SYSTAT` `RETURN`

If you see a system status display, your computer is probably up and running fine and your problem is fixed.

C. Checking terminal cables:

1. Make sure the terminal cables are firmly connected to the correct ports. The terminal the computer boots on is usually connected to Port #0.
2. Make sure the cables are firmly connected to the terminals. If a terminal has two ports, make sure the cable is plugged into the correct one—usually labeled MAIN—not the AUX or PRINTER port.

3. For printers, make sure the correct ends of the cable are attached to the computer and the printer—cable ends are usually not interchangeable for printers.
 4. If there is a problem with the terminal cables, correct the problem and reset the computer. If it comes up normally and the terminals seem to work all right, your problem is fixed.
- D. Disconnect all terminals except the terminal you are testing.
- E. Reset the computer. If it comes up normally, and there is no problem with the terminal, you know one of the other terminals may be the problem.
- F. Connect another terminal and go to Step D again. Repeat until you find the problem terminal.
- G. Check the terminal option settings against the terminal manufacturer's manual. Check for:
1. Correct baud rate. **Note:** Your computer as shipped from Alpha Micro assumes the terminal it boots on is set for 19200 baud.
 2. Set for full duplex (not half duplex) operation.
 3. Set for remote (not local) operation.
 4. Set for a data word length of 8 data bits.
 5. Set for no parity.
 6. Set for 2 stop bits if the terminal works at 110 baud; 1 stop bit if it works at any other baud rate.
 7. Set for conversational (not block) mode.
 8. For a printer, make sure it is on-line.

If the option settings are wrong, correct them and reset the computer. If it is up and running and the terminal works all right, your problem is fixed.

- H. If you have a known good terminal similar enough to the problem terminal to work in its place, substitute it for the questionable one and reset the computer.

If the computer is up and running and the terminal works all right, you know the problem lies with the terminal, not the terminal cable. Put the original terminal back on and proceed to Step J.

If the problem is still there with the new terminal, put the original terminal back on and reset the computer. Continue with Step I.

- I. Check the terminal cable. If you suspect it might be damaged, try substituting another cable and resetting the computer. If it comes up normally and the terminal works, you can assume the original cable is bad.

Remove the cable hoods from both ends of the bad cable and look for broken wires. If you feel comfortable doing so, review the cable constructions in Appendix A to see if there are any errors in cable construction.

If there is a problem with the cable, repair it or call your VAR for help. If you have repaired the cable, try hooking the terminal up again and performing "Procedure #3: Powerup/Reset." If the computer comes up normally and the terminal works all right, you have fixed the problem.

- J. If the terminal has a self test mode, use it to determine the problem with the terminal. Use the manual provided by the terminal manufacturer for instructions on interpreting the terminal self test. If the test mode tells you what the problem is, correct the problem and reset the computer. If it comes up normally and the terminal works all right, you have fixed the problem.

- K. You were not able to find a specific problem with the terminal. Call your VAR if you still suspect a problem with your terminal.

- L. Return to the current procedure or go on to the next procedure on your checklist.

Procedure #5: Self Test

- A. Read the introduction in the self test user's guide that came with your computer.

Get an overall idea of the test, the terminal display, and the front panel Status Display.

- B. Now look over the table Self Test Checker below.

These codes are taken from the full list of normal and error codes given in the self test user's guide.

The error codes to watch for on the front panel Status Display are listed in the Blinking column. If an error occurs, the self test blinks the code for it. The code for the beginning of each subtest is given in the Steady column. Steady means normal condition.

The special symbols used in the Self Test Checker have these meanings:

The slash character (/) means the codes blink alternately, showing the type of error and its location.

The letter X in the asterisked (*) items means a digit (1-9) will display. Record the digit you see on the screen.

The ranges 1-16 and 1-2 in the asterisked (*) items mean a number in the given range will display on the screen. Record the number that appears.

C. ∞ Turn the computer off. Perform Section C. of "Procedure #3: Powerup/Reset".

D. ∞ Start the self test: hold down the reset button on the front panel while you turn on the power by pressing the power button on. This enables the self test. Release the reset button.

E. ∞ Let the self test know your terminal's baud rate.

The terminal you use for the self test must be plugged into one of the four serial I/O ports on the CPU board. It cannot be attached to either of the two parallel ports.

The numbers 80 and 82 mark the beginning of the test and they only appear on the display for fraction of a second, followed by a steady 5b. When you see a steady 5b, press your keyboard's space bar several times. This tells the self test your terminal's baud rate so it can display messages at the correct baud rate.

F. ∞ Note which of the tests apply to your computer.

On the screen, the self test displays an inventory of your computer's configuration to let you know it will test only the components it has detected. You may want to check these off on the Self Test Checker, shown in the table below.

G. ∞ Observe the front panel Status Display and the screen.

If a blinking error code appears on the front panel Status Display, check it off on the Self Test Checker.

As each test finishes, note whether the component being tested passed or failed.

If an error occurs during the Memory Test, the addresses of the errors display on the screen. Jot them down on the Self Test Checker.

H. ∞ Stop the self test at an appropriate time.

After the self test finishes testing all the devices, wait until it's performing the system configuration inventory again and press the reset button to end the test.



There is a slight chance you might damage the data on the disks if you interrupt the test while it is testing one of the storage devices.

If the test loops on the configuration test and stays on error code 80 or 8F and won't go further, press the reset button to stop the test.

If the test loops on the memory test, and stays on a memory error code and won't go further, press the reset button.

I. If errors were found, call your VAR for help.

To find out what the blinking number you circled or recorded means, refer to your self test user's guide.

Be sure to keep your Self Test Checker, since that information will be of help to your VAR.

J. If the self test didn't find a problem, return to the current troubleshooting procedure or perform the next procedure on your checklist.

SELF TEST CHECKER

| Configuration Test | | Memory Test | | Interval Timer Test | |
|--------------------|----------------------------|--------------|--|---------------------|----------------|
| Steady 80 | Blinking 80 5b 8F | Steady 90 | Blinking 9X/1-16* 8F/1-16* 8F | Steady 98 | Blinking 98 |

| Serial Port Test | | Hard Disk Test | | VCR Test | |
|------------------|---------------------|----------------|---|--------------|----------------------------|
| Steady A0 | Blinking A0/1-2* | Steady A8 | Blinking A8 A9/11 AA/11 Ab/11 | Steady b0 | Blinking b0 b1 b3 |

| Diskette Drive Test | |
|---------------------|----------------------------------|
| Steady b8 | Blinking b8 b9 bb bc |

NOTE: A / indicates two codes blink alternately. An * indicates the code is in the range shown. X stands for any single digit.

Procedure #6: Alternate Boot

You perform this procedure when previous procedures indicate something may be wrong with the software on your System Disk. The object of this procedure is to see if the computer can boot off some other device—whether or not you are successful in booting tells your VAR quite a bit about what might be wrong with your computer.

First, verify the boot ID switches on the back panel of the computer, or the Eagle 550 CMOS configuration parameters, for the correct alternate device. Refer to Chapter 2 for details on boot ID switch settings and the CMOS configuration menu. When you are sure the setup is correct for the device you are attempting to boot from, proceed.

A. If your computer does not contain a diskette drive, skip to Step B.

If your computer contains a diskette drive, and you usually boot from a hard drive, place a diskette containing the system software—usually labeled "System Disk"—in the drive. Push the reset button.

If the computer boots, there is probably some scrambled data on your hard disk preventing the computer from booting from it. Although once you are familiar with the computer you can easily restore the System Disk yourself, we recommend that as a new user you contact your VAR for help. Stop.

If the computer does not boot, you may have a more serious problem. Contact your VAR for help.

B. If your computer does not contain a diskette drive, you can create a warm boot tape using a streaming tape drive:


To warm boot from a streaming tape:

1. Load your warm boot tape into your streaming tape drive.
2. Push your computer's reset button. In about 30 seconds you should see a message giving the version number of the operating system. Then you see a dot, the AMOS prompt symbol.

If you do see the operating system message and a dot, you have successfully warm booted. Because this is a warm boot you do not see the system initialization command file on the operator terminal. Go to the next step.

If you do not see the operating system message and a dot, try performing the warm boot once more. If you still do not see the message, call your VAR for help. Stop.

3. Enter the following command:

```
DIR SYS:AMOS* 
```

If your terminal displays a list of files including two with .INI and .MON extensions, you know at least some of your System Disk is intact.

Although once you are familiar with the computer you can easily restore the System Disk yourself, we recommend that as a new user you contact your VAR for help at this point. Stop.

CHAPTER 8

STATUS DISPLAY CODES

Your computer provides various tools for you to use to assure yourself your computer is healthy and operating as it should. For instance, your computer is capable of testing itself and checking most of its own internal components for proper operation.

Besides letting you know when things are working correctly, if a problem should occur, these tools help you find the cause. This chapter describes these diagnostic tools:

- [∞]Status codes: normal and error status codes that appear on the front panel display when you boot your computer system or run the self test.
- [∞]The self test feature: a powerup diagnostic test that checks all major hardware components in the main chassis. (The self test is discussed in detail in the self test user's guide that came with your computer, but we'll introduce it here).

FRONT PANEL STATUS DISPLAY CODES

During normal operation, when you are not using the self test, the front panel status displays a zero. When you boot your computer, a series of codes appears in rapid succession on the display as the AMOS operating system gets itself up and running. If an error occurs during booting, one of these codes may remain on the status display. This can tell you what was happening when the error occurred.

In the first table, the first digit of many status codes is shown as x . This digit is either 2 or 3, and identifies the device the computer is attempting to boot from:

- [∞]2 = The alternate boot device.
- [∞]3 = The primary boot device.

If you have an alternate boot device selected, the first few status codes will always begin with 2 since the computer checks the alternate device first. If there is a bootable tape or diskette in the alternate boot device, the first digit of the status codes remains 2. If there is no bootable medium in the alternate device, the computer boots from the primary device and the first digit of the status codes changes to 3.

Front Panel Status Codes - All Eagle Systems

| CODE | MEANING |
|-------------|---|
| 0 | Computer is functioning normally when the front panel status LED displays a zero and the run light is on. |
| 4 | Computer is out of QUEUE blocks. |
| 8 | A/C power dropped below an acceptable level. |
| 9 | Memory parity error. |
| 10 | An interface driver (.IDV) defined in a TRMDEF statement in the system initialization command file was not found in account [1,6] on the boot device. |
| 11 | A terminal driver (.TDV) defined in a TRMDEF statement in the system initialization command file was not found in account [1,6] on the boot device. |
| 12 | System initialization command file not found. |
| F | Computer is now clearing and sizing memory. |
| 20 | The computer is beginning to execute the boot PROM. An error at this point indicates your computer has a faulty PROM. Contact your VAR. |
| 21 | The computer is transferring the instructions from the PROM into its Random Access Memory (RAM). If an error occurs here, your computer might have a bad PROM or bad memory. |
| 22 | The computer is generating a checksum of the instructions in Random Access Memory. If this calculated checksum doesn't match the checksum coded into the instructions themselves, you see a 2E error code. |
| x3 | The computer is initializing the boot device. If the boot stops at this point, it may indicate a hardware problem with the boot device. For disk devices, when turning power on, this code might remain on the display for a short time while the disk drive spins up to operating speed. |

Front Panel Status Codes - All Eagle Systems (continued)

| CODE | MEANING |
|------|---|
| x4 | The computer is reading the Master File Directory (MFD) from disk. An error at this point indicates disk problems. |
| x5 | Searching for the User File Directory (UFD) account [1,2] on the boot device. |
| x6 | Searching for BADBLK.SYS. Valid only on disk drives that use a BADBLK.SYS file. |
| x7 | Loading BADBLK.SYS. Valid only on disk drives that use a BADBLK.SYS file. |
| x8 | The computer is searching for account DSK0:[1,4]. An error at this point may indicate disk problems. Try reloading the latest version of the system software. |
| x9 | The computer is looking for the system monitor file in DSK0:[1,4]. If this file is missing, reload the latest version of the system software. |
| x9 | If your computer is trying to boot from a tape device, this code indicates the computer is searching for a label block on the tape. |
| xA | The computer is loading the AMOS monitor from the boot device. This code might indicate a disk problem. |
| xb | The computer is beginning to execute the AMOS monitor program. If an error occurs at this point, try reloading the latest version of the system software. |
| xd | Computer bootup failed because of a time-out error. This code may indicate faulty memory or an addressing problem. |
| 2E | Computer bootup failed because of a bootstrap loader program checksum error. This code may indicate a bad PROM or bad memory. |
| xF | Computer bootup failed because of an invalid boot device selection. Check the boot ID switches on the back panel of your computer, or the Eagle 550 CMOS setup parameters. See Chapter 2 for proper settings. |

Additional Front Panel Status Codes - Eagle 550 Systems Only

| CODE | MEANING |
|------|--|
| CS | The computer is asking the operator if he wishes to enter CMOS setup. The operator has three seconds to press ESC on terminal port 0, which must be set at 19200 baud. |
| CE | CMOS parameter checksum error. This code will flash on the front panel for several seconds to inform the user. |
| CC | The computer is testing the CMOS RAM for proper operation after detecting a CMOS checksum error. |
| CF | CMOS RAM failure. The system is going into a halt state. The user may need to replace the RTC chip at U80. |
| B0 | CMOS battery voltage is low. Data that was stored in CMOS RAM is not guaranteed. Replace the CMOS batteries. |
| B1 | While in the backup state, the battery voltage dropped temporarily (for example, if the batteries were just replaced). The initial CMOS data parameters are not guaranteed. |
| 7 | A Level 7 interrupt has been executed. Terminal port 0 is now in debug mode at 19200 baud. This will only happen if the LEVEL7 software is loaded in system memory. Please refer to the Level7 documentation for further details. |

For more information on status display codes, and on how your own programs can send a number to the status display, please refer to the *System Operator's Guide*.

Other status codes can appear during Self Test; these codes are discussed in the *Self Test User's Guide* that came with your computer.

The next series of display codes are related to the Eagle 550 UPS status port only.

Front Panel Status Codes - Eagle 550 UPS Status Port

| CODE | MEANING |
|---------------|---|
| 40 | Inverter running, UPS normal or system has recovered from an AC power fail. Only displayed if the UPS status cable is installed on the UPS port. |
| 41 | UPS is in bypass; Please turn on the run switch, the computer system is running without battery backup. |
| 42 | UPS detected an AC power failure and the system is running on batteries. This status is updated every second that the AC power is off. |
| 44 | Low battery detected. Batteries are recharging, please check the age of your batteries, they may need replacing. |
| 45 | A low battery condition exists and the UPS is in bypass. |
| 46 | UPS inverter is running and a low battery condition exists. Only 2 minutes of battery power remains. System shutdown is eminent. |
| 48 | An internal fault has been detected in the UPS. |
| 49 | An internal fault has occurred in the UPS and the UPS is in bypass. |
| 4F | The UPS status cable is not plugged in. |
| 8 Flashing | UPS low battery condition has existed for more than 2 minutes. The system has executed a shutdown procedure. This procedure has deactivated write-caching on any disk drives which have write-caching enabled. The system is now in a HALT condition until the batteries in the UPS are completely dead. Turn off system power! To reset this condition the user must get the UPS primary power back on line. Check the UPS input power breaker and be sure it's ON! The system must be rebooted with a hardware reset. |
| 8 Steady | The computer's internal DC power supply has detected an internal power failure. Call your service technician, he may need to replace the internal power supply. |

SELF TEST FEATURE

One of your computer's most helpful features is its ability to test itself and check its major hardware components for proper operation. The major purpose of this diagnostic test is to check all hardware whose failure might prevent your computer from operating properly, and to assure you all hardware components are working correctly.

If the diagnostic test reports a problem, you can contact your Alpha Micro VAR for help. Tell your VAR the information displayed by the diagnostic test; it will help the technicians give you quick service by narrowing the problem down to a specific piece of hardware within the computer.

Because the operation of the self test and the codes displayed by the self test differ depending on the version of the boot PROMs contained in your computer, the appropriate self test information for your computer can be found in the self test user's guide that was shipped with your computer.

APPENDIX A

SERIAL, PARALLEL, UPS AND ETHERNET CONNECTOR CONFIGURATIONS

The types and number of connectors found on the rear panel of your Eagle computer will vary, depending on the hardware configuration you order.

SERIAL I/O CONNECTORS

The Eagle 100's main electronics board, the AM-137, includes four or eight on-board RS-232 serial ports. All on-board ports interface to standard DB-9 connectors and use the AM318.IDV interface driver starting at octal port #0.

The Eagle 100 CPU has a connector to accommodate one expansion I/O board. The expansion I/O board can be either an AM-314 four-port board, or an AM-318 eight-port board. The functional characteristics of the expansion I/O boards is detailed below.

Eagle 300-500 computers have no on-board serial I/O ports, but have connectors to accommodate up to four I/O expansion boards. These systems boot via the first installed I/O expansion board, which can be either the AM-314 or AM-318 board. The two expansion I/O boards can be mixed to meet your system requirements. The functional characteristics of the I/O expansion boards are as follows:

- AM-314 serial I/O boards have four serial ports and support both RS-232 and RS-422 protocols. The AM-314 uses the AM314.IDV interface driver and standard female DB-9 connectors, which are attached to the rear panel of your computer.
- AM-318 serial I/O boards have eight serial ports and support RS-232 only. The AM-318 uses the AM318.IDV interface driver and an RJ-21 50-pin Telco connector. The Telco connector, as it appears on the rear panel, is identical to the connector used for connecting external SCSI devices to the Eagle computer. The RJ-21 serial I/O port locations are clearly labeled on the system rear panel to avoid confusion, and are shown on the rear panel illustrations in chapter 2 of this manual.

The Eagle 550's I/O interface board, the AM-319-20, includes four on-board RS-232 serial ports. All four serial ports have standard RJ-45 connectors and use the AM318.IDV interface driver for octal port numbers 0 through 3.

The Eagle 550 system chassis has seven rear panel slots designed for serial I/O expansion. These slots can be used for standard Alpha Micro I/O paddle cards, such as the AM-359, which connect to the A-channel expansion bus on the AM-319-20 board.

For even more flexibility, the first six slots can be used to house I/O paddle cards, and the seventh slot can be used for connection to an AM-3501 I/O expansion chassis. The expansion chassis can accommodate an additional seven serial I/O paddle cards which are connected back to the B-channel expansion bus on the main AM-319-20 board.

AM-359 serial I/O expansion paddle cards connected to the A-channel bus use the standard AM359.IDV interface driver. AM-355 serial I/O expansion paddle cards connected to the A-channel bus use the new AM355A.IDV interface driver. Paddle cards connected to the B-channel bus use the AM355B.IDV and/or AM359B.IDV interface drivers.

Although several different types of I/O paddle cards are available, Alpha Micro highly recommends the use of AM-359 eight-port serial I/O cards for serial I/O expansion. The AM-359 paddle cards use the same standard RJ-45 connectors and cables as the Eagle 550's on-board ports, they can be purchased with or without optical isolation protection, and they consume less I/O select addressing than any other I/O expansion card, which allows for more ports per I/O channel!

WHAT IS RS-232?

All Eagle serial ports support RS-232. RS-232 is the name of a standard developed by the Electronic Industry Association (EIA) to encourage standardized interfacing of devices to computer systems. The letters RS stand for Recommended Standard. The RS-232 interface standard specifies electrical signal characteristics and names, and defines the functions of the signal and control lines that make up the interface.

Basically, implementing this standard involves assigning standardized signal definitions for the various pins of the RS-232 connector at either end of your terminal or printer cables. For example, the wire attached to Pin #2 carries the signal interpreted on the computer end as "Input Data from Terminal" and on the terminal end as "Transmit Data To Computer."

You enable these specific signals by attaching cable wires to certain connector pins.

If a terminal or printer manufacturer says their device is RS-232 or RS-232C compatible, it will probably be easy for you to connect it to your Alpha Micro computer system.

Before constructing the cable to connect a printer or terminal to your Alpha Micro computer system, you need to consult the manufacturer's manual accompanying the device. It will tell you how to wire the connector on the device end. Few devices use all of the defined signals, in most cases, you need to connect only three or four pins.

Although printer cables are sometimes a little more complicated on the printer end, terminal cables are often the same on both computer and terminal ends.

Alpha Micro uses both the DB-25 pin connector and the DB-9 pin connector for RS-232 device connection. Your computer may use DB-9 or RJ-45 connectors at the computer end, depending upon model numbers. The maximum length of RS-232 cables is **50 feet** between devices.

WHAT IS RS-422?

RS-422 is supported by the AM-314 board only. Because of rapid technological advancements, it became necessary to extend the RS-232 standard. The EIA adopted three related standards that permit higher data signaling rates, greater distances between devices, balanced interface circuits, and loop-back testing. The standards are RS-422, RS-423 and RS-449. For Alpha Micro computers, we need be concerned with only RS-422 and RS-232. Longer cables are allowed if the user uses low capacitance twisted paired cable. This cable should have an overall shield which is grounded. This is necessary to eliminate EMI (Electro^oMagnetic^oInterference) from affecting the communications link between the device and the computer. This shielded cable also eliminates emitted electrical interference to other systems. Cable length and type will be explained in a later section.

The RS-422 interface uses balanced signal lines in pairs. It has greater immunity to electrical noise and can run over longer cables. The maximum length of Alpha Micro RS-422 cables is **1000 feet**. The user should install data line voltage protection on cables that are from 200-1000 feet long. The maximum data rate for both RS-232 and RS-422 signals is 57.6K.

All AM-314 serial I/O ports can be configured for RS-422 operation. In addition, your serial peripherals must be able to operate using RS-422 signal levels.



The AM-318 serial I/O board, as well as the Eagle 100's eight on-board serial ports, and the Eagle 550's four on-board serial ports do NOT support RS-422.

IMPORTANT NOTE:

The Federal Communications Commission (FCC) has established rules regarding allowable emission levels of Class A computing devices (ref: Subpart J of Part 15 of FCC Rules). The Alpha Micro systems to which this manual applies have been determined to be in compliance with the FCC rules. However, you should be aware that if other devices, such as terminals and printers, are attached to these systems, even if the devices are attached in accordance with the instructions contained in this manual, the resulting configuration may not be in compliance with the referenced FCC rules. Corrective measures, if any are required, are the responsibility of the user. Information on emission levels of peripheral devices should be obtained from the manufacturer of the device.

CABLE CONSTRUCTION GUIDELINES

If you want to construct your own cables, there are a few things you should keep in mind before soldering the cable connectors:

Cable Length

We strongly recommend that RS-232C cables be not more than fifty feet long. As you increase the cable length beyond fifty feet, the reliability of the data signal decreases. The cable's susceptibility to noise and cross-talk is proportional to its length and bandwidth, so RS-232C restricts both. This is based on untwisted paired cable. The following restrictions apply:

1. [∞]Slew rate—The slew rate is the speed with which the signal changes from high to low. The higher the slew rate, the more likely you are to create noise interference on other devices. To control interference on neighboring circuits, the slew rate of drivers is limited to 30V/us.
2. [∞]Bandwidth—The bandwidth is limited on receivers to reduce cross-talk (the effect of one line on another).

These are some things you can do if the cables absolutely must be longer than fifty feet:

1. [∞]Alternatives to the RS-232 standard (RS-422 and RS-423) do allow communication over cables longer than fifty feet. You will need some special equipment to implement these standards, however.
2. [∞]Signal conditioning equipment (for example, a "short haul modem") can improve signal quality.

Cable Type

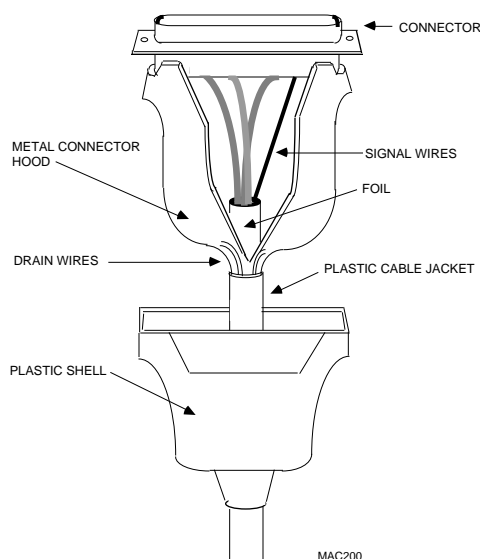
We recommend you use a twisted paired overall shielded and jacketed cable— which is rated at least CMP Level 3. You can use level 5 CMP cable for lines longer than 100 feet. The CMP stands for Communication cable Plenum rating. Most cities now require that any low voltage communication cable have a Plenum rating when the cable is run in air return spaces. This type of cable should comply with your local fire codes for installation in your facility. Using a high quality twisted paired, overall shielded cable, helps minimize electromagnetic interference. Reducing this interference not only protects your system from signal noise, but protects other devices around your Alpha Micro computer system (such as a TV or radio) from interference radiated by an improperly shielded system.

Please see the following section titled "Cable Shielding" for instructions on creating an adequately shielded cable that will provide satisfactory protection from interference. Please see the "Important Note" above for information on your responsibilities concerning electromagnetic interference.

Cable Shielding

There are different techniques for shielding a terminal or printer cable, but the method we recommend as best satisfying FCC shielding requirements is to use a metal connector hood that connects to the cable shield. Alpha Micro has pre-made cables available using this shielding technique.

The shielded cable consists of several layers. On the inside are the colored wires that carry the data signals. Surrounding these wires is a metal foil covering. On the outside of the foil covering are small, uncoated, "drain wires." Completely surrounding all of the above elements is the plastic coating that forms the outside of the cable.



Shielding a Cable

The technique for making an adequately shielded cable involves connecting the metal cable hood to the cable drain wires to ensure electrical continuity. Please refer to the figure above.

When you strip the end of the shielded cable to allow access to the signal wires, also strip a small amount of the plastic coating back from the interior foil layer of the cable. Trim the drain wires and bend them down over the plastic coating of the cable. Make the signal wire connections by soldering the proper signal wires to the appropriate connector pins as discussed in the preceding section.

Next, put the metal connector hood in place, enclosing the cable. Bend the drain wires back up over the outside of the connector hood neck, and solder them into place. Crimp the supplied strain relief ring over the connector hood/cable connection as shown in the figure above. If a plastic outer shell is provided for the metal connector hood, put it in place now.

The new RJ-45 Serial ports have a shield ground connection at pin 1. All cables adapters and assemblies have the shield ground connection to pin 1. These pre-made cables assemblies are available from Alpha Micro and their part numbers and details are documented in the AM-359 product installation instructions.

AM-314, AM-318 and AM-359 Signal Pinout References

The AM-314, AM-318 and AM-359 installation instruction manuals include pinout and cable construction information:

- *AM-314 - 4-Port Serial I/O Installation Instructions, PDI-00314-00*
- *AM-318 - 8-Port Serial I/O Installation Instructions, PDI-00318-00*
- *AM-359 - 8-Port Serial I/O Installation Instructions, PDI-00359-00*

RS-232 DB-9 CONNECTOR SIGNALS

The following table shows the signal-to-pin orientation applicable to each standard DB-9 serial I/O connector:

Rear Panel DB-9 Connector Signals

| PIN | Direction | RS-232 Signal Name |
|-----|-----------|--------------------------|
| 1 | | N/C—no connection |
| 2 | Input | RxDx—Received Data |
| 3 | Output | TxDx—Transmitted Data |
| 4 | Input | CTSx—Clear to Send |
| 5 | Output | RTSx—Request to Send |
| 6 | Output | N/C—no connection |
| 7 | | GND—Signal Ground |
| 8 | Input | DCDx—Data Carrier Detect |
| 9 | Output | DTRx—Data Terminal Ready |

NOTE: x = channel number. For example: RxD3 = Received Data, channel 3.

RS-232 DB-9 to DB-25 Terminal Cables

This section tells you which pins to connect to construct cables for particular terminals supported by Alpha Micro. We have grouped the signals into pairs which will also allow longer and more reliable communication to the computer system.

The AM-60, AM-62, and AM-70 terminals are all RS-232 devices and use the same cabling. The AM-62A, AM-65, AM-72, and AM-75 terminals when used as RS-232 devices, also use these pinouts.

The following table gives the pinouts required for RS-232 cables connecting a terminal to the computer:

Pinouts for RS-232 Terminal-to-Computer Cables

| Terminal End DB-25 Connector | | | Computer End DB-9 Connector | |
|---------------------------------|------|-----------|--------------------------------|--------|
| SIGNAL | PIN# | DIRECTION | PIN# | SIGNAL |
| TXD | 2 | -----> | 2 | RXD |
| GND | 7 | <-----> | 7 | GND |
| RXD | 3 | <----- | 3 | TXD |
| DTR | 20 | -----> | 4 | CTS |

The DTR connection (pin 20) to the computer (pin 4) can serve as 'READY/NOT BUSY' handshake line to prevent 'overrunning' the terminal with data. This protocol is also effective for several printers used by Alpha Micro.

Caution: While this cable configuration enhances the use of the Alpha Micro terminals, it may degrade system performance with other types of terminals and printers if they do not provide a compatible DTR on pin 20. In such cases, the connection to pin 4 at the computer end should be disconnected.

Workstation Connection Cables

RS-232 pin assignments for connecting an IBM PC-compatible Workstation to the Alpha Micro computer are listed below.

Pinouts for Workstation-to-Computer Cable

IBM PC/AT and Compatibles

| Workstation Serial I/O Port | | | Computer End DB-9 Connector | |
|--------------------------------|------|-----------|--------------------------------|--------|
| SIGNAL | PIN# | DIRECTION | PIN# | SIGNAL |
| TXD | 3 | -----> | 2 | RXD |
| CTS | 8 | <----- | 5 | RTS |
| DSR | 6 | <-- | | |
| DCD | 1 | <-- | | |
| RXD | 2 | <----- | 3 | TXD |
| RTS | 7 | -----> | 4 | CTS |
| GND | 5 | <-----> | 7 | GND |

NOTE: Pins 1, 6 and 8 on the workstation connector are jumpered together.

IBM PC/XT and Compatibles

| Workstation Serial I/O Port | | | Computer End DB-9 Connector | |
|--------------------------------|------|-----------|--------------------------------|--------|
| SIGNAL | PIN# | DIRECTION | PIN# | SIGNAL |
| TXD | 2 | -----> | 2 | RXD |
| CTS | 5 | <----- | 5 | RTS |
| DSR | 6 | <-- | | |
| DCD | 8 | <-- | | |
| RXD | 3 | <----- | 3 | TXD |
| RTS | 4 | -----> | 4 | CTS |
| GND | 7 | <-----> | 7 | GND |

NOTE: Pins 5, 6 and 8 on the workstation connector are jumpered together.

RS-232 RJ-45 TO DB-25 CABLES FOR TERMINALS AND PRINTERS

The following table shows the signal-to-pin orientation of each of the Eagle 550's four on-board serial I/O connectors. Note that this particular cable uses an RJ-45 to RJ-45 patch cord, and a DB-25 connector adapter to interface the terminal or printer. The AM-359 serial I/O paddle cards can use the same identical cable when required.

*******RS-232 RJ-45 to DB-25 Connector Signals**

| Computer End | | *****RJ-45 Patch Cord | | Terminal or Printer DB-25 Adapter | | |
|--------------|------|--------------------------|------|--------------------------------------|------|----------|
| SIGNAL | PIN# | DIRECTION | PIN# | DIRECTION | PIN# | SIGNAL |
| RXD | 5 | <----- | 5 | <----- | 2 | TXD |
| RTS | 4 | -----> | 4 | -----> | 5 | CTS |
| TXD | 3 | -----> | 3 | -----> | 3 | RXD |
| DTR | 6 | -----> | 6 | -----> | 8 | DCD |
| CTS | 2 | <----- | 2 | <----- | 20 | DTR |
| GND | 7 | <----- | 7 | <----- | 7 | GND |
| DCD | 8 | <----- | 8 | <----- | 4 | RTS |
| Shld GND | 1 | <----- | 1 | <----- | 1 | Shld GND |

The patch cords should be internally twisted-pair cable with RJ-45 connectors on both ends. The pin assignments are straight through (pin-for-pin) with no swapped ends.

Alpha Micro also offers a pre-made cable featuring an RJ-45 connector on one end, and a standard female DB-9 connector on the other end. For more information on RJ-45 cable adapters and types, refer to the AM-359 product installation instructions (PDI-00359-00). The AM-359 PDI has details on the cables and adapters available from Alpha Micro to interconnect just about any serial device to these ports.

PARALLEL PRINTER PORTS

Eagle 100 computers have one standard-speed parallel port, accessed from the rear panel via one DB-25 female connector. Eagle 300-500 computers have two high-speed parallel ports, and Eagle 550 computers have four high-speed parallel ports. All Eagle parallel ports support the industry standard Centronics interface. The signal pinouts for the parallel ports are as follows:



To insure the reliability and performance of your parallel ports, avoid using parallel printer cables longer than **six feet**.

Centronics Interface Cabling Signal Pinouts**PIN # SIGNAL NAME**

| | |
|----|--------------------------------|
| 1 |Data strobe |
| 2 |Data 1 |
| 3 |Data 2 |
| 4 |Data 3 |
| 5 |Data 4 |
| 6 |Data 5 |
| 7 |Data 6 |
| 8 |Data 7 |
| 9 |Data 8 |
| 10 |Acknowledge |
| 11 |Busy |
| 12 |Paper Error |
| 13 |Select |
| 14 |Auto Line-Feed (Not used) |
| 15 |Error |
| 16 |Printer Reset |
| 17 |Select In |
| 18 |Ground |
| 19 |Ground |
| 20 |Ground |
| 21 |Ground |
| 22 |Ground |
| 23 |Ground |
| 24 |Ground |
| 25 |Ground |

EAGLE 550 UPS STATUS PORT

The UPS status port on the Eagle 550 back panel is a male DB-9 connector. The UPS system also has a male DB-9 connector for its switch contact port. To connect the UPS to the computer you will need a cable with two Female DB-9 connectors. The following table shows the pinout connections required to make this cable. You will need an 8-wire cable, and both grounds are necessary!

| CPU Signal Name | <-----cable-----> FDB-9 FDB-9 | UPS Signal Name |
|--------------------------------|---|--------------------------------|
| FAULT | 3 <----- 1 | FAULT |
| GND | 2 <----- 2 | GND |
| GND | 5 <----- 5 | GND |
| ON BYPASS | 6 <----- 6 | ON BYPASS |
| LOW BATTERY | 7 <----- 7 | LOW BATTERY |
| INVERTER ON | 8 <----- 8 | INVERTER ON |
| AC PWR FAIL | 9 <----- 9 | AC PWR FAIL |

ETHERNET FEMALE DB-15 A.U.I CONNECTOR (EAGLE 300-550 COMPUTERS)

Eagle 300-550 computers have an on-board 15-pin high performance Ethernet port that supports standard (thick) Ethernet cabling configurations. The 15-pin connector is A.U.I. (Attachment Unit Interface) compatible, and with the addition of a commercially available transceiver, the port can be converted for thin Ethernet operation.



Eagle 300-550 computers actually have two Ethernet connectors; the DB-15 A.U.I. connector described above, and one RJ-45 10Base-T connector. You can't use both connectors at the same time, you must select one or the other. Information on how to select the desired Ethernet port can be found in the *Eagle Computer Service Manual*. For Eagle 550 computers the selection of this port is controlled from the CMOS setup menu. Please refer to the CMOS setup procedure in this manual.

To use the Ethernet port, you need Alpha Micro's networking software, AlphaTCP and/or AlphaNET. For AlphaTCP setup instructions, please refer to the *AlphaTCP Administrator's Guide*, DSO-00187-00. The *AlphaNET Installation Instructions*, DSO-00064-00, explain how to configure an AlphaNET network.

During network setup, you must enter a network driver name. Alpha Micro offers two types of network drivers, NDVs and LDVs. The Eagle computers use these drivers:

| Computer | LDV Name | NDV Name |
|---------------|------------|------------|
| Eagle 100/200 | AM366E.LDV | AM366B.NDV |
| Eagle 300-500 | AM319.LDV | AM319.NDV |
| Eagle 550 | AM319S.LDV | None |

The Super Eagle (Eagle 550) does not support AlphaNET, and therefore does not need an NDV. If you need to use AlphaNET with an Eagle 550, use ITC tunneling. See the *AlphaTCP Administrator's Guide* for more information.



LDVs work only with AlphaTCP networks. You cannot use an LDV with an AlphaNET network. You can, however, use ITC tunneling (using AlphaNET protocols over an AlphaTCP connection) with an LDV.

ETHERNET RJ-45 10BASE-T CONNECTOR

The Ethernet RJ-45 10Base-T port functions exactly like the DB-15 Ethernet A.U.I. port described in the previous section. In fact, both of these ports use the same Ethernet driver. The following section explains some of the technical aspects of Ethernet networking, as well as the cable pinouts required when using the 10Base-T (RJ-45) interface connector.

10Base-T Topology and Cabling

Ethernet networks were originally designed to be multi-point networks arranged as a bus topology. That meant that Ethernet would work over coaxial cable (either thick or thin) with 50 ohm termination at each end of the network, and each computer would attach directly to the same cable.

With the introduction of 10Base-T, Ethernet can be connected via inexpensive twisted pair (Level 5 compliant) cabling, with each computer having its own RJ-45 termination. As a result however, the network topology is changed so that a central repeater or "hub" is required to perform the task of re-broadcasting both data and Ethernet control signals to all other computers connected to the Ethernet. Such repeaters are commonly available from commercial sources.

10Base-T connections use 100 ohm un-shielded twisted pairs, with at least two pairs per cable (one set of pairs for transmitting data and another for receiving). 10Base-T cables terminate in eight pin RJ-45 connectors with the following pin assignments:

10Base-T (RJ-45) Connector Signals

| RJ-45 pin no. | Signal Name |
|---------------|-----------------|
| 1 | Transmit Data + |
| 2 | Transmit Data - |
| 3 | Receive Data + |
| 6 | Receive Data - |

The 10Base-T specification allows a maximum distance of 100m (approx. 300 feet) between the computer and hub.



Ethernet is available for Eagle 100 computers as an optional feature, based on the purchase of an AM-366 Ethernet Product Installation Kit.

APPENDIX B

THE CONTROL CHARACTERS

Your terminal keyboard allows you to type control characters which perform special functions. A control character is the signal transmitted to the computer when you hold down the **CTRL** key and press another key at the same time. The following list contains the most important control characters. The *AMOS User's Guide* contains a complete list of control characters and their functions.

Control-C

Control-C is the system interrupt command. You use it to interrupt whatever program is in progress and return to AMOS command level. After pressing **CTRL/C** to interrupt a program, you cannot resume execution of that program; you must start it over from the beginning.

Some programs, such as AlphaVUE, do not recognize a Control-C as an exit command; instead you must use the exit command for that program if you want to return to AMOS command level.

Other programs do recognize a Control-C; however, if an exit command exists for a program, it is usually better to use that command than to press **CTRL/C**. Many programs perform various closing functions when you use their normal exit commands and would not have a chance to perform those procedures for an orderly exit if you bypass them by using a Control-C.

Control-U

At AMOS command level, you may move the leftmost character of the command line you are typing by pressing **CTRL/U**.

Control-S

A program or command often displays more data on your terminal than fits on one screen. To stop the screen display, press **CTRL/S**.

You can now read the data on the screen at your leisure. Not only does the display freeze, but AMOS actually stops sending data to your terminal until you press **CTRL/Q** (see below); at that point, AMOS resumes sending information where it left off.

While a Control-S is in effect, AMOS stores, but does not act upon, anything you type except for **CTRL/Q**. There is, however, a limit to how

much can be stored. The exact number of characters depends upon your initial system setup.

Control-Q

When you press **CTRL/S** (described above) to freeze the screen display, you must press **CTRL/Q** to resume the screen display. If you have typed anything while the Control-S was in effect, a Control-Q tells AMOS it can now go ahead and act upon that input.

Try this: Press **CTRL/S**, then type **DIR****RETURN**, and then **PRINT****RETURN**. The commands aren't displayed on the screen and it appears that nothing happened. Now press **CTRL/Q** to release the display, and you see first a list of the files in your account printed on the screen, then a display of the files waiting to print.

Control-R

The command buffer is an area of memory where the computer stores commands that have been entered. Pressing **CTRL/R** shows you what commands are in your command buffer.

If the line editor is installed on your computer, you will be able to use **CTRL/R** to call up previous command lines, make changes to them, and then submit them again. This is a great convenience if you want to enter a series of similar commands; you can just keep making minor changes to one command, and reusing it.

APPENDIX C

SUPER I/O

Super I/O, which requires a PIC (Product Installation Code), is designed to significantly increase character output for all serial ports using the AM318.IDV, AM-359.IDV or AM359B.IDV drivers. This includes all AM-318 and AM-359 board serial I/O ports, as well as the Eagle 100's eight on-board serial ports and Eagle 550's four on-board serial ports. The more terminals you have on your system performing character output, the more you will benefit from Super I/O.

For example:

A Super I/O enabled Eagle 040 based computer with 32 AM-318 serial ports performing constant terminal output will transmit five times as many characters during a given time period, compared to the same configuration not using Super I/O. In the real world, of course, you won't have 32 terminals performing constant terminal output, but this example should give you some idea of the Super I/O performance potential.

Super I/O handles character output in a much more efficient manner than any other previously released AMOS serial port driver, which greatly reduces the load on the CPU and makes more CPU cycles available for other tasks.

Super I/O Software

Super I/O is not supported on 1.X AMOS operating systems. Super I/O has been incorporated into the AMOS 2.2C operating system since patch release^oPR8/95. However, in order to use Super I/O software it must be enabled as explained in the following section.

Enabling Super I/O



Once you enter the product installation code (PIC), the product overlay file is forever modified and will not accept a new PIC. This can be a problem if you happen to enter an incorrect PIC. As a safeguard, make a copy of the Super I/O overlay file before you do the SSD encodement. Type:

```
COPY SER000.SAV=SER000.OVRRETURN
```

By saving an unmodified version of the overlay file, you will be able re-enter the PIC if necessary.

To perform the SSD encodement, enter the following commands:

```
LOG SYS:RETURN  
SERPICRETURN
```

You will be prompted for a Product Installation Code (PIC).



If after entering the SERPIC command, the program responds by displaying a PIC, this indicates the encoding has already been completed. Nothing else needs to be done, assuming, of course, the PIC displayed matches the code given to you by Alpha Micro.

This PIC is a unique identifier for your system that must be purchased and obtained from Alpha Micro. Enter the PIC, carefully verifying you have entered it correctly and press ^{RETURN}.

After a brief pause, you will be returned to AMOS command level and you can proceed with the remainder of the installation. If you see the error message ?Improper SSD after you have rebooted the computer, it probably means you have entered the PIC incorrectly.

As mentioned above, you cannot SSD encode the same overlay twice; to re-encode the Super I/O software, do this command first:

```
COPY SER000.OVR=SER000.SAVRETURN
```

You will now be able to re-encode Super I/O. If after once again rebooting the computer you still receive the same error, check with your dealer to make sure the correct PIC was supplied for your computer.

After the PIC procedure is completed and the computer has been rebooted, all serial ports using a super I/O compatible driver will be able to take advantage of Super I/O.

DISABLING SUPER I/O

For most of your super I/O compatible serial ports, you will want to always have Super I/O enabled. However, if you have some application program that does not run properly on a Super I/O enabled serial port, it is possible to disable Super I/O. You can disable Super I/O on one or more AM-318 or AM-359 boards, but you can't disable Super I/O on an individual serial port.

Disabling Super I/O on All I/O Boards

If the application causing problems is one you run infrequently, you can temporarily disable Super I/O on all your AM-318 or AM-359 ports by using the following procedure:

1. Create a copy of your system initialization command file; type:

```
LOG 1,4(RETURN)  
COPY TEST.INI=AMOS32.INI(RETURN)
```

2. Use AlphaVUE to modify your TEST.INI file. Locate the first AM318 or AM-359 TRMDEF statement. Disable Super I/O by adding **/O** (that's an "O", not a zero) to the first AM-318 or AM-359 TRMDEF statement. For example, change:

```
TRMDEF TERM2,AM318=0:19200,AM65,100,100,100
```

to

```
TRMDEF TERM2,AM318/O=0:19200,AM65,100,100,100
```

3. Finish out of the AlphaVUE file by pressing ^(ESC) to reach Command Mode. Then press ^(G) and press the ^(RETURN) key.
4. The MONTST command will force your computer to boot from the TEST.INI file. The **/O** switch will disable Super I/O on all AM-318 I/O boards.
5. Once you have completed running the program that exhibits problems under Super I/O, you can reboot your computer using the standard system initialization command file, which will reactivate Super I/O.

Disabling Super I/O on Individual AM-318 or AM-359 Boards

When your computer is processing your system initialization command file, it loads a copy of the AM318.IDV or AM-359.IDV file when it encounters the first TRMDEF statement for an I/O board. This same copy of the .IDV file is used for all subsequent I/O boards. This being the case, if you use the **/O** switch in the first AM-318 or AM-359 TRMDEF statement, Super I/O is disabled on all I/O boards in your computer. In some cases, you may want disable Super I/O on a particular AM-318 board, while leaving Super I/O enabled on your other I/O boards. The procedure for doing this is as follows:

1. First, make a copy of your AM318.IDV or AM-359.IDV file; make sure the copy uses a name other than AM318.IDV. For example, while in the DVR: account, type:

```
COPY AM318S.IDV=AM318.IDV RETURN
```

2. Create a copy of your system initialization command file; type:

```
LOG 1,4 RETURN
```

```
COPY TEST.INI=AMOS32.INI RETURN
```

3. Use AlphaVUE to modify the TEST.INI file. Locate the AM-318 or AM-359 board or boards) for which you want to disable Super I/O. For all eight of the TRMDEF statements substitute **AM318S** in place of AM318. Do this only for the AM-318 boards for which you want to disable Super I/O. The same technique can be used for AM-359 boards
4. Now, you must add the **/O** switch to the very first TRMDEF statement that uses the AM318S or AM359S driver. For example:

```
TRMDEF TERM17,AM318S/O=20:19200,AM65,100,100,100
```

5. Finish out of the AlphaVUE file by pressing ESC to reach Command Mode. Then type G and press the RETURN key. The MONTST command will force your computer to boot from the TEST.INI file. The **/O** switch will disable Super I/O only for the AM-318 or AM-359 boards using the AM318S or AM359S driver. All I/O boards using the standard driver will remain Super I/O enabled.

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